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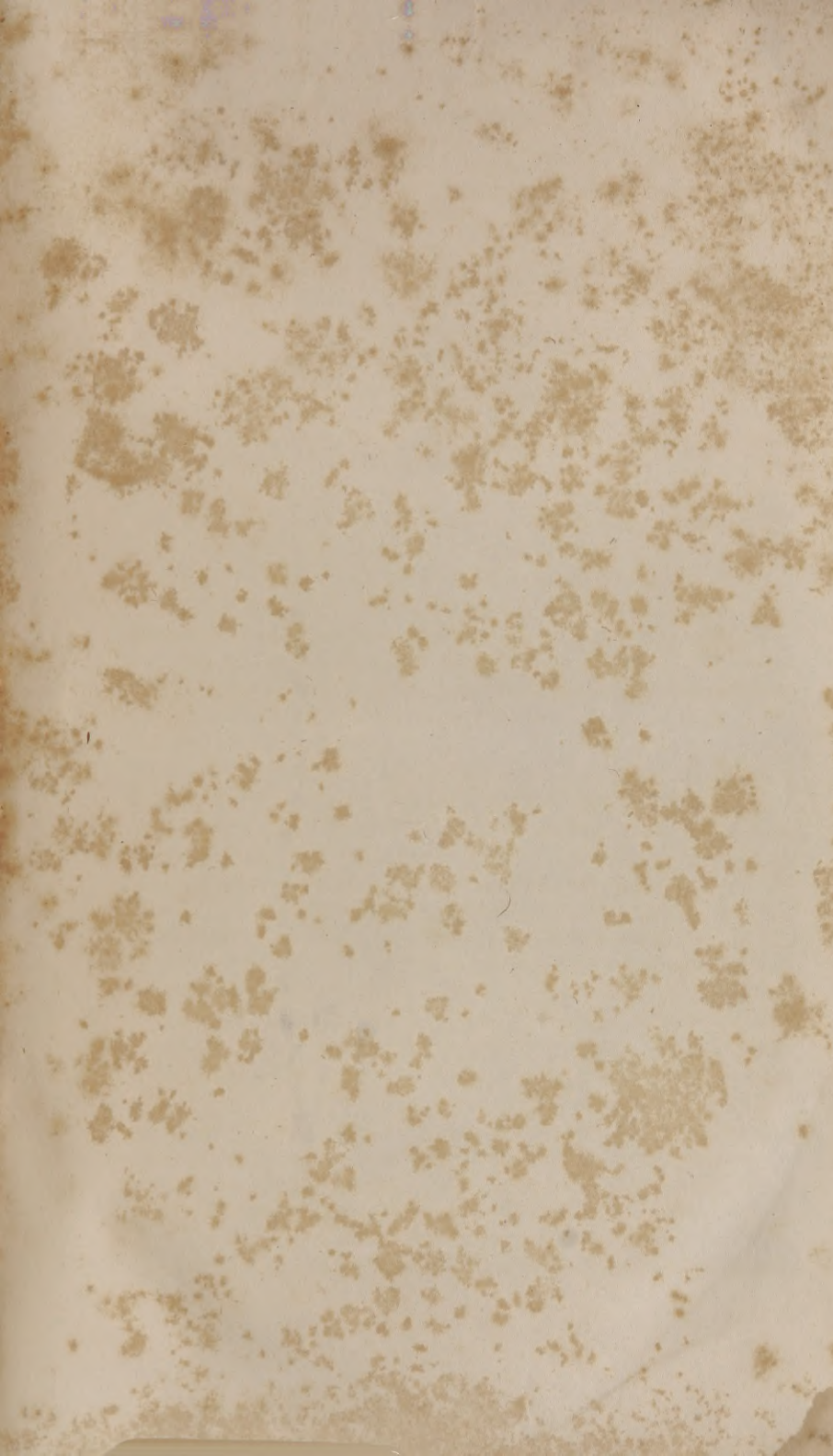
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Book _____

PRESENTED BY

Dr. Stewart Roberts







RECOMMENDATION.

MESSRS. HARPER & BROTHERS,
GENTLEMEN,

It is deemed unnecessary in this note to advance one word in behalf of the great work of Professor Samuel Cooper, of London. The labours of that author have been so long before the public, have received so extensive a patronage by the cultivators of medical and surgical knowledge throughout Europe and in this country, as to place the Surgical Dictionary in the very first rank of those undertakings which have enabled the science of which it treats, and rendered it indispensable to every student and practitioner of the healing art. Our business on the present occasion is to renew to you our thanks for the most acceptable edition with which you have just favoured the profession, of that vast repository of surgical literature and science. In the present reprint we find you have carefully embodied the great mass of original matter which the author has inserted in his seventh and last edition, and have also again commanded the talents of the same able and efficient editor, Professor Reese, to enrich the work still farther with a becoming record of the great achievements in the operative departments of chirurgical art which American skill and intrepidity have made known.

We are free to assert that the labours of Professor Reese have been executed with great fidelity, and may justly be looked upon as the result of a diligent investigation into the merits and services of American surgeons throughout the Union, drawn up with commendable zeal and impartiality. Critical as the task may have been, Professor Reese has evinced peculiar dexterity in its execution, and has excited in the minds of his fellow-labourers in the cause of humanity admiration of the talents he has displayed, and gratitude for the accession of knowledge which he has so advantageously placed within their reach. The Old World will have additional reasons in this excellent digest

RECOMMENDATIONS.

of American Surgery by Dr. Reese, to estimate in a still more favourable light this branch of professional science as cultivated by the New.

VALENTINE MOTT, M.D.,

Professor of Surgery in the University of New-York.

ALEX. H. STEVENS, M.D.,

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Professor of Anatomy and Surgery in the Washington University of Baltimore.

J. W. R. DUNBAR, M.D.,

Late Professor of Surgery in the Washington University of Baltimore.

A similar testimonial of the merits of this new American edition has also been received, bearing the signature of

WM. GIBSON, M.D.,

Professor of Surgery in the University of Pennsylvania.

Professor Cooper, of London, writes to the American editor, under date of October 24, 1842, as follows:

"I take the earliest opportunity of expressing to you the pleasure I experience in hearing of the advanced state of another American edition of my Dictionary. I think myself fortunate in having a gentleman of your professional attainments to bring my work out in America, enriched with numerous valuable observations collected in the field of experience there. The new edition, I have no doubt, will evince the same candour and love of truth, the same ability, and the same desire to promote the cultivation of scientific and practical surgery, so convincingly manifested in all that you did for the improvement of the former edition. Your testimonials of the merits of your distinguished countrymen will not be overlooked in future editions of my work, &c.

SAMUEL COOPER."

A
DICTIONARY
OF
PRACTICAL SURGERY:

COMPREHENDING

ALL THE MOST INTERESTING IMPROVEMENTS, FROM THE EARLIEST
TIMES DOWN TO THE PRESENT PERIOD;

AN ACCOUNT OF THE INSTRUMENTS AND REMEDIES EMPLOYED IN
SURGERY;

THE ETYMOLOGY AND SIGNIFICATION
OF THE
PRINCIPAL TERMS;

AND NUMEROUS REFERENCES TO ANCIENT AND MODERN WORKS,
FORMING A CATALOGUE OF SURGICAL LITERATURE, ARRANGED ACCORDING
TO SUBJECTS.

BY SAMUEL COOPER,

SENIOR SURGEON TO THE UNIVERSITY COLLEGE HOSPITAL; PROFESSOR OF SURGERY IN THE SAME COL-
LEGE; SURGEON TO THE QUEEN'S BENCH, &c., &c., &c.

FROM THE SEVENTH LONDON EDITION,

REVISED, CORRECTED, AND ENLARGED.

WITH NUMEROUS NOTES AND ADDITIONS, EMBRACING ALL THE PRIN-
CIPAL IMPROVEMENTS AND GREATER OPERATIONS INTRO-
DUCED AND PERFORMED BY AMERICAN SURGEONS.

TOGETHER WITH A

SUPPLEMENTARY INDEX,

IN WHICH THE SCIENCE OF SURGERY IS BROUGHT DOWN TO THE PRE-
SENT PERIOD, INCLUDING ALL THE RECENT IMPROVE-
MENTS IN EUROPE AND AMERICA.

BY DAVID MEREDITH REESE, A.M., M.D.,

PROFESSOR OF THE THEORY AND PRACTICE OF PHYSIC, AND OF THE PRINCIPLES OF SURGERY IN CAN-
TLETON MEDICAL COLLEGE, VERMONT; AND PROFESSOR OF THE INSTITUTE OF MEDICINE AND
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MARYLAND; MEMBER OF THE MEDICAL SOCIETIES OF MARYLAND
AND PENNSYLVANIA, &c., &c.

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G. 24
AS STUART Roberts

PREFACE

BY THE AMERICAN EDITOR.

THE exalted reputation acquired by this Dictionary having obtained for it almost exclusive preference in Great Britain, on the Continent, and throughout the United States, it will be altogether unnecessary for the publishers to introduce the work or its distinguished author to the American public by any new testimonials. Nor will it be expected of the American editor to attempt a laboured commendation of this compendium of surgical literature, with the view of attracting a larger share of attention from the profession than it has already received in its former publications in this country. It has long been esteemed a standard work, is adopted as a text-book in our universities, colleges, and schools of medicine generally, and finds a place in the library of every surgeon in the country.

The first republication in this country was edited by the late distinguished Dr. Dorsey, of Philadelphia; whose valuable improvements carried it through a second and third edition; and under the title of "Dorsey's Cooper," it rapidly gained upon public favour. The author availed himself of most of the American additions in revising his work for a fourth edition, from which it was again reprinted in America, with an appendix, by Mr. Wm. Anderson, of New-York.

Since that time, Mr. Cooper has published a fifth, and recently a sixth edition, improving and enlarging the work by availing himself of the new and valuable discoveries in surgical knowledge to which he has access; and from this last revision of 1830, the present stereotype edition is republished. And as it has passed through two revisions by the author since it was printed in America, and the last includes all that is novel and interesting among British and continental surgeons down to the present year; its republication, even without any semblance of improvement, will be acknowledged to be a desideratum by all who would keep pace with their improving profession.

As in every species of human science our highest attainments are but an approximation towards perfection, so in the science of surgery, each succeeding year demonstrates that all that is known of the principles or practice of our art, is but the prelude to still higher exhibitions of science and skill, alike honourable to the profession, and valuable to the cause of humanity. To condense and arrange all the novel and interesting facts which clinical experience is furnishing, and upon which alone the edifice of true science can be erected, is a task worthy of the immense labour which Mr. Cooper has bestowed on each succeeding reprint of his Dictionary, and one to which he has proved himself entirely adequate. The extensive and multiplied resources to which he has access, furnish him with facilities possessed by few; and in availing himself of these, he has exhibited an industry, and, for the most part, an impartiality, worthy of all praise.

Within the last few years, our profession, and especially the department of Surgery, has been making steady, and even rapid advances in almost every country. Many diseases formerly among the opprobria of our profession have yielded to the science and skill of modern surgeons. Besides the vast improvements made in the treatment of surgical diseases, operations have been performed with entire success for the relief of injuries, but a few years ago esteemed irremediable; and some of them of so bold and difficult a character, that to propose them would have been a hazard of reputation which but few could have then survived.

Learning is not indigenous to any country; and although national pride sometimes prompts to exclusive pretensions, yet the history of surgery, so far as this is concerned, forbids such presumptuous arrogance. The question, "Who hears of American surgeons?" is no longer tauntingly repeated; since the discoveries and operations of some of them have extorted a tribute of admiration from almost every country where this science is cultivated, and given to their names professional immortality. In this, as in the other departments of learning, we may be allowed to say, without the imputation of vanity, that our countrymen have shown to demonstration, that when the tree of science is transplanted across the Atlantic, it is capable of taking as firm a root as in its native soil.

The improvements which surgery has received in the United States, and especially within a few years, although highly important to the interests of the profession and to the cause of suffering humanity, are far from being generally known even in our own country, and still less to the profession abroad. Our periodicals containing them have but a limited circulation, and local views have multiplied their number, until many of the States, and most of our medical institutions, have a vehicle of their own; thus still farther contracting the sphere of their usefulness. And although several of them are most ably conducted, and are adapted to general circulation, we are yet without the advantages which would result from a periodical, strictly national, in which the whole profession might combine their energies for the promotion of science, and to which all might have free and equal access.

From these periodicals our European brethren obtain their information relative to the state and progress of medical and surgical science among us, and some of them never find their way either into Great Britain, France, or Germany. Hence foreign authors are so often charged with criminal remissness in their notices of American surgery. But when we advert to the small proportion of the surgical improvements of this country which have ever been published at all, and recollect that of these but a few are ever seen by our British or continental brethren, we may find an apology for much of the neglect of which we have complained.

That there has been a disposition on the part of some European writers to pass over in silence every thing American, has long been a subject of remonstrance; and in relation to some of these, there is doubtless just ground of complaint. How far Mr. Cooper will be found in the same condemnation will be estimated by those who peruse the present edition, and who will, of course, award him due praise for so much as he has said of American surgery. It is difficult to believe that he has introduced all he knew on this subject, and it is certain that he might have known much more equally worthy of his notice.

In preparing the present edition for the press, the publishers have desired that it might include all that is novel and interesting among American surgeons; and

have committed to the present editor the task of collecting and arranging the materials furnished by our periodicals and original publications, and of condensing these with such original matter as he might be able to obtain, sufficiently important to merit introduction into this Dictionary.

To perform this duty in a manner which should be acceptable to the profession and useful to the community, no pains or labour has been spared. How far he has succeeded in this humble task of compiling from the productions of his fellow-countrymen an epitome of American surgery, remains to be adjudged by those for whose benefit he has been thus employed. He claims no merit for himself, other than that of having rendered, as far as possible, equal and exact justice to the claims of gentlemen in every part of our common country, whether living or dead; and for this purpose, he has availed himself of every accessible means.

He has corresponded with distinguished surgeons in various and remote parts of the land, from many of whom he has received communications of great merit and practical importance. To the periodicals of the last few years he has had frequent recourse, and from most of them he has extracted improvements and inventions which cannot fail to interest and instruct. He must also acknowledge his obligations to Dr. Gross's edition of *Tavernier's Operative Surgery*; Dr. Sterling's translation of *Valpean's Surgical Anatomy*; and to the late Philadelphia edition of *Cooper's First Lines*, with notes by Professor Stevens, of New-York, and the "Philadelphia Editor."

To a number of his professional friends in New-York, as well as in distant parts of the United States, the editor is greatly indebted, not only for the assistance rendered, but for the encouragement they have given him in the performance of this duty. And although he has not heard from some who had promised communications, yet he has availed himself of their published works, and introduced all the operations they claim, so far as his limits would permit.

The limits assigned him by the publishers for enlarging the work, have rendered it necessary to abbreviate and condense many new and important surgical improvements more than was agreeable to his own wishes; and this must be his apology for so frequent reference to the works and periodicals in which they are recorded at length. The same reason will account for the brevity of many of the notes, which consist of mere hints, upon which some amplification would have been more congenial to his own views, and perhaps more acceptable to the profession. It is but an act of justice, however, on the part of the editor towards the publishers to state, that they have suffered him to transcend their limits very considerably, and allowed him a brief appendix for the purpose of introducing some articles unavoidably omitted under their appropriate heads.

It will be perceived by those who have the opportunity of comparing this with the late London edition, as revised and enlarged by the author, that it contains the whole of the matter of that edition, although the size of the type has somewhat diminished the number of pages. Although many of the terms, doctrines, and operations are now obsolete, and might very plausibly be omitted, yet as Mr. Cooper has seen fit to retain them, it has been thought best to make no alteration whatever in the work, and hence also the long catalogue of references at the end of each article is preserved, although many of the works cannot be obtained in this country.

The original matter introduced by the American editor will be found im-

bodied in the text, in immediate connexion with the subject to which it refers, except where an occasional foot note for obvious reasons has been preferred. To distinguish it from the rest, it is included within brackets, and at the close of each of these additions will be found the surname of the editor.

This method of making interpolations in the body of the work may appear less imposing than an array of additions in an appendix at the end of the book, or a display of notes at the foot of the pages, distinguished by asterisks, obelisks, &c.; but they will certainly be found more convenient to the student, and more in conformity to the character of a dictionary. It is from this conviction that this course has been pursued; which, it is hoped, will be satisfactory to the profession.

As the work is stereotyped, it will be necessary in future editions to enlarge the appendix, which can be done to any desirable extent, and the Dictionary may thus keep pace with the steady advancement of surgical knowledge in this and other countries. For the purpose of supplying any omissions which may have been inadvertently made, it is intended at first to publish but a small edition, sufficient to supply the present demand, and any communications from American surgeons will receive respectful notice in a future edition, by being included in the appendix at the close of the second volume. Such communications are respectfully solicited, and may be forwarded to the editor without delay.

To rescue American surgery from unmerited neglect, and to present to our transatlantic brethren a brief epitome of what is doing in the United States for the promotion and improvement of surgical science, is the object at which the editor has directed this effort. That his task has been imperfectly performed he is fully conscious, nor will he affect to conceal his own misgivings in thus attempting to improve upon the work of one of the master-spirits of the other hemisphere. How far the haste with which the work has been hurried through the press, to supply the great demand which is every where felt and expressed, may have contributed to his imperfections, he will not attempt to determine; perhaps his inexperience in such a vocation may be more plausibly urged. His design, however, is now completed; and he submits the result to his brethren in the profession, and to students of this noble science, with no other wish than that it may contribute to elevate our national character, and excite to the still further cultivation and improvement of surgical literature.

DAVID MEREDITH REESE, M.D.

New-York, August 22d, 1830.

PREFACE
TO THE
SIXTH LONDON EDITION.

THE utility of this Dictionary to students and all classes of medical practitioners, has obtained for it in this country a larger share of patronage than was perhaps ever conferred upon any other book of surgery; while its translation into the French, German, Italian, and Russian languages, and several republications of it in America, may be taken as proofs of its being deemed worthy of considerable notice in various other parts of the world. At Milan, one translation of it was produced a few years ago; and I learn from a letter, with which I have lately been honoured by Dr. Cressimbini, president of the Medico-Chirurgical Society of Bologna, that he is preparing another Italian translation, into which he proposes to introduce additional subjects, and such remarks as are founded upon his own researches and experience. The diligent and enlightened Germans were not only the first to undertake and complete a translation; they have bestowed still greater attention upon my humble endeavours to promote the cultivation and diffusion of surgical science; for they have followed up their translation by a series of well-executed engravings, expressly designed to illustrate the nature of the diseases, accidental injuries, and curative methods, treated of in this Dictionary.—(See *Chirurgische Kupfertafeln*, &c. *Wien*, 1820—1829.) Of these valuable plates, the publication of which I regard as an honourable compliment to my surgical labours, nearly fifty numbers have already been brought out at an extremely moderate price; and it is with real pleasure that I recommend them to the notice of every surgeon who is a German scholar, as being the most useful collection of surgical and pathological plates ever offered to the profession.

In preparing this edition, which is enriched with an account of all the latest improvements in surgery, I have conscientiously endeavoured to deal fairly and impartially with every individual whose name I have had occasion to mention, or whose suggestions form subjects of consideration in the ensuing pages. My aim has been truth, wherever I could find her; and in every situation where any glimpse of her beautiful figure presented itself, I have ardently courted her, regardless of the name, school, or country on which she might deign to shed her glory. By steadily adhering to this principle; by zealously marking what the book of nature and the field of experience unfolded; by renouncing all obsequious submission to every other kind of authority; and by taking the liberty of sometimes thinking and judging for myself; I trust that the most likely plan has been adopted of maintaining the character of this book, and raising my own humble reputation.

According to my usual plan, I subjoin the notice of a few things, which were either inadvertently omitted in the articles to which they relate, or communicated to me after such articles had been printed.

[The several additions which follow in Mr. Cooper's preface, for the greater convenience of the student have been inserted in the body of the Dictionary, under the respective articles to which they refer. They will be found designated by the abbreviation *Pref.* affixed to the termination of each.]



SURGICAL DICTIONARY.

ABD

ABAPTISTON. (From *ἀβ*, not, and *βαπτίζω*, immerse, to sink under.) *Galen*, *Patricianus Aquapendente*, and especially *Benardus*, in his *Anatomicalum Chirurgiarum*, are denominated the crown of the uterus, because it formerly had a conical shape, which kept it from penetrating the os uteri too rapidly, and pressing its teeth in the dura mater and brain. While, however, it is admitted by modern surgeons that mischief may be done by letting the same penetrate too deeply, they do not find it necessary to obviate the possibility of such an accident, by using a conical trepan, with which it would be difficult to make any penetration at all; but they guard against the danger, by observing particular rules and cautions laid down in another part of this book. — (See *Thyphloide*.)

ABDOMEN. The Belly. When a surgeon speaks of the cavity of the abdomen, he confines his meaning to the space included within the bag of the peritoneum. Hence, neither the kidneys nor the pelvic viscera are, strictly speaking, parts of the abdomen.

Antiquaries have divided the abdomen into different regions, the terms allotted to which are so frequent in the language of surgical books, that some account of them in this Dictionary seems indispensable.

The middle of the upper part of the abdomen, from the costal cartilage as low down as a line drawn directly across the greatest convexity of the cartilages of the ribs, is called the epigastric region.

The spaces at the sides of the epigastric region are named the right and left hypochondriac or Epiploic-drua regions.

The umbilical region extends from the navel upwards to the line forming the lower boundary of the epigastric region, and downwards to a line drawn across from one inferior superior iliac fossa process to the front of the other.

The middle space, below the last line, down to the os pubis, is named the hypogastric region.

The parts of the abdomen situated on the outside of the umbilical region to the right and left, or laterally with respect to two perpendicular lines drawn from the greatest convexities of the cartilages of the seventh true ribs, are named the ilio or iliac. On each side of the hypogastric region is situated the inguinal region or groin. The whole of the last part of the abdomen has only one technical appellation, viz. the lumbar region or loins.

As the abdomen is the frequent situation of several important surgical diseases; is much exposed to wounds; and various operations on different parts of it are often indispensable; it claims the particular notice of every practical surgeon. One of the most common affections to which mankind are subject, is that in which some of the bowels protrude. This disease is called hernia, and ought to be well understood by every practitioner, who, however, can never acquire the necessary knowledge without being minutely acquainted with the anatomy of the abdomen. In dropsical cases it is frequently proper to tap the abdomen; and this operation, named paracentesis, simple as it may seem, requires more consideration and attention to the anatomy of the parts than many surgeons bestow. — (See *Hernia*, *Paracentesis*, and *Wounds*.)

Abdomen, *Abdomen* of the eye, may take place either within the cavity of the belly, or at some part of its circumference, and may be either of an acute or chronic nature. Women are generally considered more liable than men to *abdomen* in and about the abdomen; the abdomen named *hemorrhoid*, being somewhere treated of, are here considered them *convulsions*. Collections of purulent matter, resembling third whay, and containing inflammatory or clovish fluid, are not infrequently named in

ABD

the cavity of the peritoneum, as one of the effects of inflammation accompanying pleural effusion. — (*Medic. Nat. Med.* t. 4, p. 215; *Lancet*, *Pathologic* Char. t. 1, p. 127, *essentials* 444. See. Paris, 1806.)

In lying in women, abscesses frequently form between the abdominal viscera and the peritoneum, especially just above the groin. They are cases which have been very correctly described by *Cruikshank*. Before the integuments proper, the diagnosis is often attended with difficulty, and sometimes an abscess penetrates several weeks; for the patients seem as if affected with slight cold pains, which yield to common treatment, particularly external applications, but soon return. Thus, unless the vicinity of Poupart's ligament be carefully examined, where some partial point, hardness, or elevation can be detected, the abscess may remain concealed until a large progression, or the extension of the matter down the thigh, lameness, &c., makes the nature of the case completely manifest. As the peritoneum adjoining the abscess is always thickened by the preceding inflammation, *Cruikshank* assures us that there is no danger of the collection of matter bursting inwards. Some abscesses, indeed, have been so enormous, that the matter actually pushed the viscera out of their places, yet all this happened without any forward bursting of the disease. The whole danger depends upon the direction of the abscess and the extent to which the matter spreads. A timely detection of the nature of the case, the use of resolute applications, and the making of an early opening, generally being the disease to a speedy and favorable termination. — (See *Agnew's Magazine* for the *Wanderer*, *Wanderer*, *Wanderer*, &c. t. 1, p. 173, Nov. 1807.)

Chronic tumors of the os uteri, which in women are stilling sometimes terminate slowly in suppuration, and fluxion of the os uteri and other abdominal viscera, leading to the formation of matter, are often the cause of painful menstruation, great sensitiveness, hortic symptoms, and death. However, sometimes salutary abscesses are produced between the viscera, by which means an outlet is obtained for the matter through the bladder, anus, or vagina. Thus (*Journal* *Lancet*) in the case of a woman who had had for a long while pain in the right iliac region, exposed to proceed from suppuration of the kidney, because pain was united with the urine; the right kidney was found after death in the natural state; but there was an abscess in the right ovary, which was adherent to the bladder, and which the pus had passed through an ulcerated communication. In another patient, who had voided pus by the anus, the right kidney was exposed and adherent to the colon, with which it was communicated by a perforated aperture. For many years a woman had a hard tumor of considerable size in the abdomen; at length the pain of it became insupportable; and just at the moment when her death was apprehended, an immense quantity of pus was cut, duly discharged from the vagina. The pain abated, the swelling of the belly subsided; merely the remains of the inflammation were any perceptible; and the woman's health was perfectly re-established. — (*Lancet*, *Pathologic* Char. t. 1, p. 128.)

The abscesses which sometimes form between the peritoneum and abdominal viscera, or between the layers of these viscera, or under the integuments of the abdomen, are attended with considerable misery, according to they happen to be divided or acute, circumscribed or diffuse, small or extensive. Those of the acute or phlegmonous kind, sometimes following stabs and contusions, are particularly noticed in the article *Wounds*. There are those which demand especial care, because if not checked they may prove

adhering to the liver, pancreas, and abdomen; and a coarse jagged beginning its internal surface from the diaphragm to the insertion of the esophagus, the coats of the stomach being an inch thick. The surface of the pancreas was also diseased, and the pylorus, situated in the middle of the cancerous mass, was contracted by the thickening of the process of the stomach, and obstructed by numerous fangs. The liver was large, but apparently sound; the spleen small. The aorta, the vena cava, and its branches, were quite natural.—(*See Journ. de Med. par Leroux, Oct. 1835, and Medico-Lir. News, vol. 3, p. 295.*)

Morgagni describes the case of a woman 34 years of age, who, after a suppression of the menses for some months, was attacked with palpitations in the epigastrium. Morgagni, on applying his hand to the part, felt a large hard body moving freely. At first, it was regarded as an aneurism of the phalanges; but, as there were no arterial throbbings in the chest, and there was nothing extraordinary in the pulse at the wrist, Morgagni concluded that the tumour in question could not depend upon the heart. Neither did he take the disease for an aneurism, because the throbbings did not correspond to the base. As for the large indurated mass, it appeared to him more like any what it was not, than what it was; it could not be named a glomus ageritum, which never looks like an aneurism. Morgagni considered the case as an hysterical spasmodic complaint, ordered the patient to be bled, and the 54th leaving the palpitation ceased.—(*Morgagni, de Anomal. de Causis Medorum, t. 2, Epist. 30, 25.*)

Senac has spoken of these abdominal palpitations as occurring in hypochondriacal and hysterical patients; and, as they frequently subside without leaving any vestige behind, he sets them down as nervous affections.—(*Traité des Mal. de Cœur.*) Dr Hays had under his care a hypochondriacal patient, affected with palpitations in the abdomen; which, with other complaints, were relieved by doses of liver opening medicines.—(*Hollings, Medical, Therapeutics Plain and Easy, 1792, t. 2, p. 21.*)

Thalheim observed a distention of the stomach, which he supposed to have been epistemic and glandular, in some persons, with palpitations in the epigastrium cordis.—(*Med. Lib. Newark, Pars 1, 1793, p. 211-277.*) My friend Mr. Hodgson, also, in speaking of palpitations in the epigastrium, which are the consequence of organic disease, and occur in irritabile hypochondrium acutum, states his opinion, that, in some instances, these palpitations were a consequence of distention of the stomach with air, which was thrown against the abdominal muscles by the pulsation of the great blood vessels; and in such cases, the throbbing was distinguished by the sensation.—(*On the Distention of Arteries and Veins, p. 96.*)

Abdominal palpitations are also described by Zedler, as a symptom of hypochondriasis and hysteria.—(*De Hypochondria, Lips. 1799, p. 78.*) They also happen in certain Schizoid diseases.—(*Traité des Mal. du Panchyphage and des Mésentériques, par C. G. C. Brasseur, Lips. 1795, p. 21; and Dr. R. Jackson in the Memoirs of Jackson, Med. Lond. 1798.*)

In a dissertation on cramp in the stomach, Hall remarks, "Quin insidit, uti distans vesicæ gastricae, contritus agrotant perenni spasmus, ut ei haud raro prominentes tumores plenis, dilatatis, in cordis et ventriculi, pulsi externi cordis maxime videntur."—(*Thes. de Gastroscopia, Opuscl. 120.*) In the same essay, there is an account of a man, who had violent palpitations in the epigastric region, apparently first excited by the larva of the tinea probably, many of which were vomited up.

Paul is another writer who describes these abdominal palpitations as an occasional symptom of hypochondriasis. "Palpitationes de vena et gastropneumone sunt, de palatione irregulata, sine ullaque parte de viderentur."—(*Nouveau Philosophique, t. 2, p. 25, Paris, an 6.*)

Dr. Albert details some cases which fell under his own notice. A young woman, whose menses were open but, and who had been for some days constipated, was seized with frequent fainting fits and stertile apnoeas, occasionally ending some the bowels a quantity of black matter, each evacuation of which was followed by a storm, the vomiting at five o'clock Dr. Albert was sent for, as it was found the patient was about to die. She was extremely exhausted, and

the fainting fits followed each other with hardly any intervals. She could just say "I feel a throbbing in the belly;" and, when Dr. Albert applied his hand to the part, he felt a violent pulsation extending from the umbilical hernia down to about the bifurcation of the aorta. The action of the heart was weaker than natural; the pulse at the wrist very small, but not quicker than it had been in the preceding day, and not synchronous with the throbbing in the abdomen. Dr. Albert concludes, that, at first, he took the case for an aneurism. Dr. Marshall was of the same opinion. Another physician, however, Dr. Wenzel, ascertained doubts of the aneurism being aneurismal, saying, that he recollected having read, several cases in Morgagni. These doubts seemed to persuade in the employment of opening medicines and clysters, continuing again with the former. Under this plan, the palpitations in the abdomen and fulgencies of the chest diminished in a few days. The stools were at first of the colour of chocolate, but afterwards possessed their natural appearance. The vomitings, in a weakened form, however, were perceptible six weeks longer. The patient at length got quite well, and was remaining so four years afterward.

A man about 40, severely afflicted with hypochondriasis, great oppression of the chest, constipation, and tension of the abdomen, tendency to fainting, &c., complained to Dr. Albert, that he felt as if his heart had fallen down into his belly, where he was annoyed with an increased throbbing. Indeed, when Dr. Albert examined the abdomen, patients he could feel a very strong pulsation, and, what is curious, could trace it like a cord along the track of the aorta, but in the course of the left iliac artery. The pulse at the wrist, which was small, frequent, and hard, did not correspond with the abdominal pulsations. For several days the aneurism from the bowels had been as thick as pitch. After the employment of gentle purgatives, all the complaints gradually abated, though the throbbings were fully perceptible six months afterward.

The next case which Dr. Albert met with is very interesting. A robust sailor, whose bowels were so constipated, that nearly the strongest purgative could affect them, was seized with constant pain in the left hypochondrium. With this complaint was soon joined great pain in the back, and a sensation as if something alive moved about in the belly from one side to the other, and thence extended up to the neck, followed by the vomiting of a greenish matter. At the same time, he felt in the left side a pulsation which he took for that of the heart, and which continued the whole of his illness. The pulse at the wrist was natural, and synchronous with that in the abdomen. In the beginning of the disease, the patient was obliged to sit with his body very much inclined forwards, as no other posture could be endured. For the first week opening medicines afforded no such relief, that he was sometimes quite free from pain for six or eight hours. After a time, a round swelling formed in the left hypochondrium, reached to the navel, and attained with incredible quickness the size of a child's head. Indeed, it could now be traced beyond the umbilicus to the right side. The venous were quite of a dark colour, or else red blood and a puriform matter were discharged. Sometimes the blood voided was of a bright red colour, sometimes it was dark, coagulable, and mixed with bile. The patient was at length worn out with febrile symptoms, and died. On opening the body, Dr. Albert found a swelling in the middle of the mesentery, the texture of which cannot be easily described, and the circumference of which was 16 French inches. The stomach was filled with coagulated blood. The spleen, pancreas, and liver were sound; but the gall-bladder was of prodigious size, and contained thick viscid bile. The aorta contracta, aorta cœliaca vasa, and the aorta mesenterica were postmortally dilated, and full of dark-colored blood. He speaks of them, however, only as being in an enlarged, not in an aneurismal state. Dr. Albert thinks it highly probable, that it was one of these vessels by which the pulsation had been communicated.

Dr. Albert has also seen these abdominal palpitations in a pusillito female; and in a healthy, who was afterward seized with apoplexy. He likewise met with a violent tremor, the mother of several children, in whom these throbbings took place incessantly at the commencement of each menses, and were a source of

of this may, that other common effluvia, as stoppage of the menses, &c. After the third month, however, they tend to cease altogether.

Many valuable practical observations on cases attended with hæmorrhages from the intestinal canal, my limits here oblige me to pass over. According to Dr. Albers, hæmorrhoidal patients, especially when put in motion, are by compression of the tumours, often sensible of throbbings about the anus, which are paid even to the hand.—(J. F. Albers, *over Polypus in the Intestine*, *Ver. Drukker*, 1833.)

Dr. Parry makes a few interesting remarks on such abdominal pulsations as evince compression of an artery. In any person, not very fat, and lying upon their back, he says, the pulse of the aorta can easily be felt, if strong pressure be made a little to the left of the median line, about half way between the navel and umbilical cord. In certain instances, the pulsation is perfectly felt by the patient himself. In many cases of this kind, particularly in females, individuals, the sense of pulsation is merely the effect of premenstrual action of the heart. While, in other cases, it is the effect of the pressure of some hard substance upon the descending aorta, determining a disproportionate quantity of blood to the head, "and pressing to the head passed on the abdomen, and sometimes even to the eye, the appearance of a beating so near the surface, as to lead inexperienced observers to conclude, that the vein is greatly dilated." According to Dr. Parry, the most common causes are obstructions of flow in the aorta, requiring repeated and active purgatives, which must bring away almost incredible discharges of mucous and watery matter before the arterial pulsation subsides.—(See Parry's *Elements of Pathology*, &c. and the *Medical Clin. Journ.*, and *Review*, vol. 1, p. 37.)

Another cause of a temporary appearance of pulsation or movement in the abdomen, not sustained by any of the preceding actions, is the power which water persons have of putting portions of the rectum in motion, and thus strong convulsive action. There seems a large absorption of the lutea stimulated with distasteful and fecid pulsations, corresponding to those of the aorta.

According to Mr. Allan Burns, a beating is generally felt about the pit of the stomach, in the advanced stage of chronic inflammation of the heart; in this case, when the pulsation is closely adherent to the lateral epigastrium, it is corrupted at every contraction of the ventricle, and the diaphragm and liver are elevated. The ventricle, however, having completely emptied itself, is again diminished, and is propulsive to the degree of dilatation, the liver and diaphragm descend, whereby an impulse is communicated in the epigastric region.—(See *Diagnosis of the Heart*, p. 293.) This valuable writer cites the remark of Morgagni (*Epist. 17*, art. 26), that sometimes, in dilatation of the heart, this organ descends so far as to push the diaphragm into the hypochondrium, and pulsate in that situation, so that the disease is sometimes for a moment of the cellular artery. In Mr. Burns's work, a remarkable case of this description is related. An erroneous judgment in the case lately is to be formed in such cases, because the pulsations of the heart and lungs are not exactly synchronous; for it is not the heart which is felt directly beating, but the liver, which, by the action of the heart, is thrown forward. Hence the pulsatile interval between the stroke of the heart and the movement of the liver.

The following fact shows how dangerous a practitioner should be in the progress. An extraordinary vessel arrived at, that he assumed a pulsation, in confirmation with all systems, vapour and incense as means, where the most dangerous pulsations of the liver, and such pulsations between the epigastrium, were swift symptoms. The pulsations could be both seen and heard at a distance, on resting the arm in which the patient sat. Several physicians were induced to suggest some organic lesion of the internal system; but their opinion was given with becoming diffidence.—on the surgeon's, his impression was, that there existed an aneurysm of the descending aorta; and such was the firm persuasion to him acquired of the reality of his impression, that he could trace the aneurysm as through the abdominal coverings, though nobody else could, and trace its magnitude and position. After death, the heart was found enlarged, and pit full of venous of enormous size. The liver was

of the stomach also exhibited traces of long existing disease; but the aorta was quite sound.—(See *Med. Juridica*, 1821, p. 71.)

Preternatural pulsation about the epigastrium is also stated by Mr. A. Burns to be sometimes occasioned by enlarged tumours, attached either to the upper surface of the diaphragm, or formed between the layers of the pericardium towards the diaphragm, as happened in an instance recorded by Lennet.

Another cause specified by Mr. A. Burns, is enlargement of the vena cava, or of the right auricle of the heart. Now describes a case in which the vena cava was as large as the aorta, and there had been a violent pulsation in the epigastrium.

The next cause enumerated by the same gentleman is increased solidity of the lungs, more especially of their lower acute margins, where they overlap the pericardium. In this case the pulsation is about the epigastrium cordis.

Mr. A. Burns likewise notices several other causes of epigastric or abdominal pulsations, already illustrated in the foregoing part of this article, including the pulsations, sometimes of the pylorus, tumours in the mediastinum, or any solid increase of substance about the abdominal aorta, or its principal branches; and, lastly, a peculiar affection of the vascular system itself.

The following observations on the criteria between various abdominal pulsations and those of aneurysms, appear interesting.

According to Dr. Albers, an internal aneurysm originates gradually, and the pulsations increase in strength by degrees. Other abdominal pulsations, on the contrary, begin suddenly, and are most violent in the beginning, abating after they have lasted some time.

In an aneurysm, the pulsation is synchronous with the stroke of the artery in the wrist; but this is not regularly the case with other pulsations.

Should the patient be affected with melancholia, hypochondriasis, hysteria, or other nervous complaints, void blood from the stomach, or a black vomit from the bowels, should there be any hæmorrhage or swelling of any of the abdominal viscera discoverable by the touch, the probability is, that the pulsations are not owing to an aneurysm.

With the exception of cases in which these pulsations are owing to mechanical impediments in the circulation, Dr. Albers believes, that they are nearly a symptom of some nervous affection. He also thinks, that the surprise excited by these throbbings arises only from their strength and duration, other analogous strong pulsations, as, for instance, those of the heart, or of the carotids being common enough in hypochondriasis and hysterical persons. The same gentleman adverts to the increased action, which, in inflammation and fever, is often more conspicuous some parts of the sanguiferous system, than in others.—(See *Pulsations on the Epigastrium*, p. 20, &c. *Albers*, 1833.) Much important additional information on this subject may be found in *Observations on some of the most frequent and important Diseases of the Heart; on Aneurysm of the Thoracic Artery; on Preternatural Pulsation in the Epigastrium*, &c. by Allan Burns, p. 292, &c. *Edin. Edinb.* 1833.

ANEURYSM. A tumor containing pit, or a collection of purulent matter.

Aneurysms are divided into two principal kinds, true, acute and chronic. For information relative to the former, see *Aneurysm*; and for that concerning the latter, refer to *Lancet Disease*. See also *Chronic Aneurysm*, and *Dissection of the Epigastrium, Hypochondrium, Mesenteric Artery*, &c.

ANISOTROPHIA. That nature has fully provided for the due evocation of this important function, is a truth of which no doubt is entertained; it must be immediately exhibited to every person who reflects upon the instance which is continually taking place in the particles of every texture of the animal body; upon the gradual and harmonious removal of the old matter in proportion as the new is deposited by the ascending arteries; or upon the impossibility of accounting for the changes produced by growth in the old and young of different organs, and, indeed, of the whole body, without consciously bringing into the explanation this important process, of which nature and even the most essential particulars, is a true, yet remote discovery. But, besides these considerations in proof of anisotrophia, many others exist which the sci-

explanatory physiologist. By the action of the absorbing and exhalant arteries, the whole mass of blood would soon be so impregnated that life would be irretrievably gone, if the sanguiferous system were not daily replenished in some way or another. The undiminished quantity of blood in the circulation, notwithstanding the constant exhalation from it by secretion and excretion; the regular fulness of the blood-vessels, notwithstanding the incessant drains from them; and the constant supply of materials for the sanguiferous functions; all imply the existence of a certain function, one principal design of which is to counteract the effect which, without it, would be rapidly and fatally produced upon the quantity of blood in the system. As M. Magendie observes, whenever any substance in the form of a liquid, gas, or vapour, is put, for a certain time, in immediate contact with an external or internal surface of the body, it is absorbed; that is to say, it passes into the blood-vessels, mixes with the blood, circulates with it, and thus exerts its effect directly or indirectly upon the viscera. This is particularly exemplified in the action of certain poisons; a drop of pure hydrocyanic acid, put on a dog's tongue, causes the animal's death in a few seconds, in consequence of being immediately taken up by the blood. Food, drink, medicines, and even air itself, only because useful to us, after having been absorbed. Many diseases, some of a very dangerous kind, are originated by absorption. In fact our existence is so inseparably connected with the function, that the suspension of it for a moment would produce almost immediate death.—(See *Journ. de Physiol. Expér.* t. I, p. 1.)

The office of the absorbents, as a modern writer has remarked, is naturally expressed by their name; it consists in receiving or taking up certain substances, and in transporting them from one part of the body to another. The substances which are thus taken up, are of two kinds, first the food and the breath; the former being received by the lacteals, and the latter by the lymphatics. The immediate object of the action of the two sets of vessels, is, however, also essentially different; that of the first being to convey a food from the part where it is formed into the blood, in order that it may directly serve for the nutrition of the body; the latter serving, in the first instance, to remove what is useless or hurtful, and to discharge it as such a system, that it may either be applied to some secondary purpose of utility, or be finally discharged from the system.—(Bainard, in *Klin. Syst. of Physiology*, vol. 2, p. 551.)

The laws of the absorbent system are far more intricate than would at first be supposed by a person only superficially acquainted with physiology and the phenomena of disease. If we wish to form a just comprehension of all the various purposes which this system fulfils in the animal economy, we must take the same enlarged view of the subject as Mr. Hunter did. We must contemplate all the modifications of absorption, and its effects both in health and disease, in the nutrition and growth of the body; as well as in the excretion, or absorption, and the dissolution, or even final removal, of parts of it, become diseased or useless.

First, According to Mr. Hunter's explanation, the absorbents take up extraneous matter, in which is included nourishment.—(On the Absorb., &c. p. 484.) By extraneous matter we are here to understand matter not originally contained within any portion of the body, nor constituting any part of its natural structure, but introduced from without. Thus the absorption of nourishment, absorbed pus, coagulable, and other substances applied to the skin, furnishes examples of the absorption of extraneous matter, which are also attended by the effects of the venereal, syphilitic, vaccine, and several other poisons. Sometimes the passage of the poison into the system and its pernicious operation, happen so rapidly, that symptoms are manifested that it must have a shorter course into the circulation than through the lymphatic vessels, the glands, and trunks. This has been supposed to be the case when animals are filled with hydropicous fluid, the venous trunks, the points of contact, the spine, &c. How far this system is true will be hereafter considered. Such is the simplicity with which the poisons of typhus fever, scarlet fever, and the ligament's head are absorbed and carried into the sanguiferous system, that in twenty seconds after being put into the cavity of the panto-

mean, their action reaches the spinal marrow.—(See *Magendie's Journ. de Physiol. Expér.* t. I, p. 18.)

Secondly, As Mr. Hunter has noticed, the absorbents take up superfluous and extraneous matter, whether natural or diseased. Thus, the removal of the old particles of the body, after they have become unfit to continue longer in their respective situations and offices,—an action that is reciprocal with the deposition of new matter by the secretory arteries; and the incessant regulation of the quantity of serous fluid in the cavities of the chest, chest, peritoneum, and tunica vaginalis, so that, though the arteries incessantly secrete this fluid, the absorbents prevent its extraneous accumulation, and combine with the blood-vessels in maintaining a continual renovation of it; are examples of the absorption of natural, but superfluous matter. On the contrary, the disposition of extraneous blood, of the fluid of serous and mucous, of coagulable lymph, or air, effused in the cellular tissue, and of an infinite number and variety of exudates and thickening of parts; are instances of what Mr. Hunter has termed the absorption of superfluous, diseased matter, or, as I should say, of superfluous matter from disease.

Thirdly, Mr. Hunter enumerates the absorption of the fat. No doubt can exist respecting the collateral changes which are taking place in the quantity of serous matter in the body, according to the state of the health, the nature of various labours, or labour to which the body is exposed, a diseased or debilitated condition of the vessel, and the effects of different kinds of regimen and diet on the whole system. Perhaps it may be supposed that Mr. Hunter should distinguish this absorption from that of other superfluous matter in the body. The reason does not appear in his writings; unless we receive as such the observation, that he did not consider the fat and matter of bones as true animal substances, as they have no action within themselves and are incapable of life. However, this would not be very consistent, because other superfluous matter, composed in the second classification, especially the fluid secreted by serous membranes, and the fluid of nutrition, are likewise superfluous parts of the living principle. At the same time I admit that the absorption of the fat may be entitled to distinct consideration on other grounds; for sometimes an absorption seems to be regarded as a much greater degree than that of other substances in the body; or at all events its absorption does not keep pace with that of its secretion, so that, although the trunks and other organs remain of their usual bulk, the fat may acquire the thickness of several inches. On the other hand, the absorbents sometimes act upon it with a quickness that does not always extend to the same term in other parts of the body. Thus in fever nearly all the fat may be absorbed in the course of a few days; yet the size of the muscles may have undergone but little reduction.

Fourthly, Mr. Hunter enumerates the species of absorption by which a waste of parts is produced, and is consequent of which the muscles become smaller, the bones flatter, &c. These cases we first exemplified in the ordinary course of nature; for in old age such changes happen in the bones and muscles, and also in other organs like the absorbent glands, which become so diminished, that some writers erroneously assert that they entirely disappear. Whenever the action of a vessel is long prevented by disease of a joint, a fractured bone, or other causes, it always dissolves away to a greater or less degree, and the limb compared with the sound one will be found to be considerably reduced. The absorption of the fat, by which the bulk of parts is also lessened under various circumstances of disease, I believe is not generally restricted to a particular liver or joint, like the absorption which affects the muscles in similar cases. Thus, when a patient becomes thinner than disease of the hip-joint, the muscles of the thigh and leg on the same side as the disease undergo a remarkable decrease of their bulk, while those of the sound limb are little or not at all altered; but the fat of the whole body is rapidly absorbed, and the greatest natural emaciation prevails.

Before the period of Mr. Hunter's writings, the knowledge of all the different purposes of absorption, by whatever organs it was supposed to be performed, whether by lymphatics or veins, was certainly very limited in comparison with the more extensive in-

formation which now permeate, and which is in a great measure the fruit of his industrious researches. Speaking of the absorbent vessels, which he considered, with the generality of modern physiologists, as the true instruments of absorption, he says: "From a further knowledge of these vessels we shall find that they are of much more consequence in the body than has been imagined, and that they are often taking down what the arteries have built up; removing waste organs, forming a modification of the form of the body in its growth, and removing many diseased and dead parts, which are beyond the power of cure."

As these vessels are productive of a great variety of changes in the animal economy, which are very characteristic in their structure and effect, Mr. Hunter considered them in two general points of view: first, as they absorb matter, which is not any part of the body itself; secondly, as they absorb the body itself. The first of these uses, the absorption of matter which is not part of the structure, he observes, is well known, and of two kinds; first, that of extrinsic matter, comprising every thing applied to the skin, and also the chyle; the other internal, comprising that of many of the secretions, the fat, the milk of bone, &c. These kinds of absorption take place principally for the two purposes of the body; but they also answer other purposes, and are very extensive; for, besides their nutritive effects, they are frequently the cause of disease in a thousand forms.

In the second of the above-mentioned views, Mr. Hunter considers the absorbents as removing parts of the body itself, and here he again views them in two lights. The first is where only a wasting is produced in the whole body or some particular part of it, to which mode of absorption he applies the epithet *atrophic*, because it consists in the removal of particles of the body out of the substance of parts which yet remain, and still form a perfect whole. This kind of absorption, Mr. Hunter says, has always been admitted or supposed, whether performed by the sense of disputation. It is often carried further than the mere wasting of the part; for it may proceed till not a vestige of such part is left, as is sometimes complained of in the total decay of testicles. *Interstitious absorption*, therefore, may be understood in two senses.

The second view taken by Mr. Hunter embraces that kind of absorption by which whole parts of the body are removed, and which is sometimes a natural, sometimes a diseased, process. "It is a view of which he particularly values the discovery. In the natural process he says, the absorbents are to be considered as the modifiers of the original construction of the body. No absorption can take place in the natural formation of many of the parts, either in the natural growth or the formation arising from disease, without the action of the absorbents, which always have a considerable share in the production of the changes. Thus in three modeling absorptions, the principle of which is an extensive as may be the natural process, bones and squamous other parts cannot be formed without it. A part which is of use in one stage of life, but becomes quite useless in another, is thus removed, as is exemplified in the decay of the eye, the ducts of the prostate, and the squamous prostates. In some cases the absorption of whole parts in consequence of disease leads to dissolving effects; one is a case in silver, and Mr. Hunter therefore calls the process by which it is produced, *dissolving absorption*. In other cases it is called, although whole parts are removed. Such three forms of absorption, he thinks, may be named *progressive*.

The removal of a whole solid part of the body, or as Mr. Hunter expresses it, "that portion which the animal economy has taken a part of itself into the circulation, by means of the absorbent vessels, whenever it is necessary," is unquestionably one of the most curious facts which can present themselves to the notice of the physiologist (nature). In Mr. Hunter's time the doctrine was a new one, but he informs us, that he had long been able to demonstrate its truth, and that he possessed the first facts of it from the waste of the secret of the teeth and of their fangs at the period of their being shed.

It may be difficult at first to conceive how a part of the body can be removed by itself; but it is just as difficult to conceive how the body can lose itself, but they are both equally true. Without dwelling on the exact mode in which such changes happen, he gives a

new idea, that "whenever any solid part of our bodies undergoes a dissolution, or is broken in upon, in consequence of any disease, it is the absorbing vessels which do it."

"When a business necessary, that some whole living part should be removed, it is evident that nature, in order to effect this, must not only render a body sensitive on the absorbents, but must direct the part to be absorbed into such a state as to yield in this operation."—See *Hunter on the Blood*, &c. p. 420—442.) For an account of *arterial absorption*, vide *Circulation*.

With regard to the difficulty which there may be in comparing how each small vessel in the lymphatics can take up solid substances, Bichat points out that the distinction between the solids and the fluids can only be said to prevail where they form a mass; but that when reference is made to their separate particles, they do not differ from each other. This, he says, is so perfectly true, that the very same particles will alternately enter into the composition of a solid and a fluid, and as the elements of water are the same, whether it be in the liquid or frozen state. Now as the transportation of solid substances takes place by the removal of these separate particles or atoms, no greater difficulty can present itself in understanding how this may be effected, than in conceiving how fluids may be absorbed. —See *Hunt. Gen. & Sp.* 52.

I come now to a very difficult question, and one that has hitherto received no satisfactory answer; not because the subject has not been exhaustively deeply, and ably considered, but because its difficulties and obscurity seem to defy all successful investigation. The question here referred to is, the most principle and by what power is the lymphatic, supposing them to be ascertained glands, enabled not only to take up the solid particles of various organs and different fluids secreted in different features and cavities, but to convey them frequently with considerable velocity and through a long tract, dispersed also by these complicated organs, the absorbent glands, into the venous system and the heart? In other words, what is their mode of action? As Mr. Hunter has observed, the principle of capillary action was at first the most general idea, because it was familiar one; but this is too confined a principle; for still it is a reason for every kind of absorption. Capillary action can only remove fluids; but as solids were often absorbed, such as fine tumours, coagulated blood, the art of others, &c., he advances for this hypothesis more completely to suppose the existence of a solvent.

"That any one may not be misled; it is one of those hypotheses that can never be proved or disproved, and may for ever rest upon opinion." But Mr. Hunter's conception of this matter was, that nature leaves as little as possible to chance, and that the whole operation of absorption is performed by an action in the vessels of the absorbents; but even under the idea of capillary action, physiologists were still obliged to have recourse to the action of those vessels to carry the lymph altogether if it had been absorbed; and they might as well therefore have extended this action to the mouths of the vessels.—(See *the Blood*, &c. p. 442.)

The question will continue without satisfactory answer, whether Hunter's language be adopted, and we say that absorption is effected by an action of the lymphatics and their outlets; or whether we employ the language of Bichat, and ascribe the performance of the functions of these vessels, and the circulation of the fluid in them, to what he is improperly (but not much to the detriment of his reasonableness) ergone sensibility and sensibility organic contractility. This assumed kind of sensibility arises from every adjacent vessel a power of feeling quite unconnected with the brain, by which it is presumed to be sensible of the presence of matter in its current, which is then imbibed and conveyed along the tube by the insensible organic contractility, by which is signified a power of contraction, not admitting of dissolution, but capable by stimulus or irritation, but without to take place in some insensible manner, chiefly because the fluid in the absorbents is known to be constantly in motion, and always flowing towards the thoracic duct. In fact, Bichat's explanation is merely a reference to two principles, which are themselves hypothetical, and more calculated to excite a playful fancy than to satisfy a sound judgment. Organic sensibility, and insensible organic contractility, he observes, are the

were remarkable in the absorbent system, as they were for a certain time death itself. A dead, exposed while the animal retains some degree of heat, is absorbed both on serous and mucous surfaces, and also in the cellular tissue, though with less freedom. This power of absorption after death, he says, may even be ascertained by keeping the artificial lung by means of a bulb, though the plate is less efficacious than in a first supposed, vital heat seeming to be essential.—(*Lect. de la Vie*, t. 2, p. 117.) All these observations, however, merely amount to a recital of the facts, that absorption may proceed for a short time after death (never later than two hours from this event, p. 115.), and that it is promoted by artificial heat; but how, or by what exact mechanism it is accomplished, is not revealed to us.

The lymphatics are not regarded by Richi as aided either with wind to form animal elasticity, or with animal contractility. His proof of the fact of these matters is, that when a lacteal vessel, full of chyle, a lymphatic filled with serosity on the surface of the liver, or even the thoracic duct, is interrupted, the animal suffers no mark of pain. But this tells him which the lacteal put in the stomach may be expected from the question to which it leads him, namely, What influence can be derived from a circumstance which, in consequence of the belly being laid open, the many openings produced would necessarily admit of air slight ventilation, even were it to exist? He also adverts to the little sensibility of the absorbent vessels in their interrupted state.—(P. 118, &c.)

He also alluded to a vital contractile property in the lymphatics, or, as Richi would express it, sensitive organic contractility. The former adopted this belief, because these vessels readily empty themselves of the chyle that is pervading them, and contract when sulphuric acid is applied to them. On the other hand, Richi argues, that sulphuric acid, like every other concentrated acid, will also kill, produce the same effect upon all animal substances, even after death, as well as a striking of them. When the absorbents, and particularly the thoracic duct, are touched with the point of a knife, they do not contract. If they are capable of contraction, Richi maintains that it is when they cease to be distended; and not when they are injured; consequently, it appears to him to be by virtue of their contractility of tissue. The opinion of which he finally arrives at, that sensitive organic contractility in them is at all events doubtful, and that, if it exist, it is very obscure, and at most not proper than that of the lacteals.—(P. 9, p. 115.)

This last inference, and, indeed, the whole of Richi's notions respecting the non-existence of sensitive organic contractility in the absorbent vessels, are very difficult to reconcile with certain observations made by himself, in other parts of his work. Thus, he observes his spleen (t. 2, p. 98), after he had frequently noticed in living animals, especially in dogs, manifest expansions in the course of a lymphatic, and containing a liquid fluid. These appearances were mostly met with on the external surface of the liver, and on the gall-bladder. When the distended portions of the vessel were touched with a needle, the fluid ran out, and they immediately disappeared. "On another occasion, I saw two or three of these small dilatations on the gall-bladder, and having then lit the lamp directed with a torch under the vessels, I saw each dilatation the next instant at not being able to find them again: so doubt says he, the contraction of the vessel had made them disappear." He adds, that the liver is the organ on which these vessels can be best seen in living animals; but its convex surface must be looked at the instant the belly is opened, for the contact of air, by making this contact, then follows their free escape through it.—(See *Ann. t. 2, p. 98*.) And in another place he says, "It is in dogs where the absorbents are full, if the skin be lifted up, they may easily be distinguished by their transparency; but very soon, notwithstanding their valves, they empty themselves, and can no longer be distinguished from the rest."—(P. 108.)

The fact of the absorbents expelling more or less of their contents, when they have been produced, might be very well ascribed to what Richi calls contractility of tissue, or even to elasticity; but, the propulsion of the fluid from a dilated portion of an uncontracted lymphatic into another portion of the same

vessel, certainly does not admit of the same explanation. The valves may determine the direction which such fluid must follow, if it move at all; the anastomoses may facilitate the progress of it; and contractility of tissue, or elasticity, may have an auxiliary effect; but its first motion can only be accounted for by supposing either that there is an impelling power in the vessels themselves, or in some organ or organs with which they are connected; or else that these contents are set in motion by external pressure, the vessel of vessels is within, or the pulsation of neighbouring arteries. Now, in some of the cases mentioned by Richi, no doubt can be entertained that the impelling power was in the lymphatics themselves, because he distinctly adverts to the contraction as speedily excited in them by exposure to the air, that the convex surface of the liver must be looked at immediately on the animal's belly being opened, or else they will not be distinguished.

Dr. Haigack contends, that "an attraction exists between the mouths of the lacteals and the chyle, which seems to be analogous to, or identical with, the elective attraction, which causes different chemical substances;" and "that the lacteals, as well as their extremities as they enter their whole extent, are possessed of contractility, by which the fluids, when they have once entered, are propelled along them; an effect which is probably generated by the pressure of the neighbouring parts, while the anastomosing valves with which they are furnished prevent the retrograde motion of their contents."—(*Ann. de la Vie*, t. 2, p. 101.) The principle on which the lacteals receive the chyle can scarcely be referred to any thing so fixed and determinate as chemical attraction, or so independent of life. On the contrary, the absorption of chyle from the lacteals may be delayed, or accelerated, or retarded, by various means of the combination, balance of life, and different altitudes of the mind. If it were a chemical operation, and the absorbence of chyle supposed to exist on the valves out of the vessel, motions, in the period of any sudden depth, the process would be expected to go on as long as that fluid and the still retained in contact; yet we have no proof of this being the case; indeed, I must, I suppose, say something between electro-attraction and the absorption of chyle; the former being an operation in which the action of vessels at their orifices, and the influence of life, are considerations totally separated from the subject; whereas, in the latter, they form in reality the main topics of inquiry. Elective attraction, however, may only be ascribed as a comparison applicable to the disposition which the lacteals have to take up certain substances, but to reject others, though even in this sense, the comparison would be very imperfect.

Dr. Haigack's opinion is probably true, that an stimulation of the action of the lymphatics must be attended with even greater difficulty, than what persons meet with in the inquiry into the principle on which the chyle is taken up and conveyed into the system. The increased difficulty chiefly proceeds from our having no positive information respecting the contraction of the lymphatic vessels, or the mode in which their contents are first received; "for there is reason to suppose that the transmission of the fluids themselves is conducted upon the same plan with that of the lacteals." As the same author remarks, we do not know where the mouths of the lymphatics are situated, with what parts they are connected; how they are brought into contact with the substances which they receive; nor by what power they are enabled to take them up.—(Vol. 1, p. 101.)

The source of the lymph is also less certain than that of the chyle; for, even at the present day, Dr. Haigack, influenced by the possibility of directing the lymphatics from the arteries, and by the anatomical nature of the lymph, and its analogy to the blood, presumes a belief, which was certainly many years ago, that it is not formed by the decomposition of the solid particles of the body, nor by fluids absorbed from various surfaces; but that it is composed of the thinner parts of the blood, which, instead of returning to the veins in the heart, pass into the lymphatics, and are conveyed to that organ through the thoracic duct. The lacteals certainly have little disposition to take up any thing but chyle; but, as Dr. Haigack has explained, "the lymphatics are capable of absorbing a great variety of substances, differing from each other most

widely in their nature, so that it would almost appear as if, by a certain mode of operation, any substance might be forced into them. Nor (says Dr. Bantock) is this distinction affected by the hypothesis of M. Magendie; for, although we might agree with him in expecting that in the ordinary operations of the system, the force at the principal, or even the most instantaneous, in removing the materials of which the body is composed, yet we have no experimental evidence, that when certain processes or medicinal agencies are applied to their introduction, they may be forced by force into them, and conveyed into the circulation. The case of pus, or other medicinal substances that are taken up by the lymphatics, may appear to be less difficult to explain, because the absorption is generally produced by fibrils, or some mechanical process, which may be supposed to force the substance into the vessels of the system, or to produce its escape from the capillaries, which may enable the substance to come into some immediate contact with the vessels of the vessels. We may also imagine that when the component parts of the body are brought into close approximation with their capillary extremities, they are then taken up in the same way that the chyle is absorbed from the intestine. (*See Essay, Syst. of Physiol. vol. 2, p. 363.*) For my own part, I believe, that if the modern doctrine of absorption can be sufficiently detailed and sustained, the general presence of the fibrils of the lymphatics of every part of the system, and the existence of the body with its vessels as cells of the living organism. Many physiologists have little difficulty in conceiving how fluids can be taken up by the lymphatics, but rather stagger at the notion of this being also the case with the nutrient fluids. Others, however, acknowledge their owed to both hypotheses, considering themselves to be then by the argument given. If the vessels capillary arteries can receive the dense, hard matter, the small lymphatics can receive it. One example is not more difficult to comprehend than the other. Yet, such reasoning leaves little light on the question, how are the some-purified for absorption, and in what manner are they taken up? These in fact remain completely unexplained.

"What inquiries a judicious physiologist are we to conceive of the intricate nature of this operation? If solution of the substance be necessary, we are at a loss to find a proper solvent; many of the solutions are insoluble in water, or in the serum that which is found in the vessels; while, on the other hand, it is perhaps not easy to conceive how the substances can be absorbed without being previously dissolved, and still more so, how the solids can have their texture broken down, and enter the vessels, particle by particle, as it were, and be suspended in the lymph in a state of extreme concentration? As I have already mentioned, these difficulties seem physiologists, including Bidder, endeavor to diminish by arguing that the lymphatics must be supposed to act only upon the elements of every texture, and that, on this principle, the absorption of solids is as easily intelligible as that of fluids, the same elements frequently contributing to the composition of both. However, it must be acknowledged, that all this kind of reasoning is entirely visionary.

It is conjectured, that while parts retain the vital principle, they are capable of resisting the action of the absorbents. According to Dr. Ross, dead matter is more easily acted upon by the absorbents than living, and in fact, "no part can be absorbed until its texture is dissolved, and consequently, until it is deprived of life. No substance can possibly enter the absorbents, while it retains its organization, so that it necessarily follows, that the preliminary step in the transport of the body is its decomposition." (*Essay, Syst. of Physiol. vol. 2, p. 363.*) He elsewhere explains, that by the death of a part preceding its absorption, is less required, "that it is no longer under the influence of arterial action. It therefore ceases to require the supply of matter which is essential to the support of all vital living parts, and the process of decomposition necessarily commences." To me a better account of the subject appears to be that which, describing of metaphysical and chemical reflections upon the supposed death and decomposition of parts, previous to their absorption, represents the absorbents as acting directly upon the individual atoms, particles, or elements of the various textures. We know nothing

about the vitality of these atoms, or elements, in their separate capacity; supposing them to possess it, we know nothing of the moment when they part with it, possibly, as their entrance into the absorbent system, such as we are completely ignorant both of the manner in which such elementary materials acquire the vital principle, and of the exact moment when they become thus endued.

What is applied to the lymphatic glands, their use is not precisely known, though various conjectures have been offered concerning it. As Dr. Ross observes, they may perform that they serve as important purposes, from the circumstance of every absorbent vessel, in some part of its course, passing through one or more of these glands, as was first observed by Haller.

Mr. Harvey is one subject, injected the lymphatic vessels from the groin to the neck, without filling any lymphatic gland, so as to prove a fact which, he says, is contradictory to the received opinion, that each vessel always pass through glands in their way to the blood-vessels. He tried, with regard to the abdomen, the absorbents not merely true, as he called the lymphatic vessels which every gland, there are others which escape them. He declares, that some of the lacteals in the mesentery do not pass into glands. (*Exp. Imp. vol. 2, p. 41, vol. 3, p. 14.*) On the other hand, Magendie, in his *Essai sur l'absorption*, does not mention the circumstance. (*Ess. Lymph. Hist. p. 3, vol. 4, p. 10.*) and Dr. Bantock refers us to Gendie's *Ann.* p. 14, in confirmation of the rarity of such an arrangement. (*Essay, Syst. of Physiol. vol. 2, p. 363.*)

The fact of every lymphatic vessel, constantly entering a gland is more part of its course, seems to Dr. Bantock to weaken the inference, that some important change is effected in the system, and through by means of the lymphatic glands. "But says he, the same mode of reasoning might lead us to conclude, that although the absorbent glands are necessary to the existence of the higher organs of animals, they are not, as far as the purpose of nutrition and growth possibly, as it appears that there are some classes of animals, which resemble the mammals in many of their sensitive functions, and in the vascular part of the absorbents, which are without any lymphatic glands, as are very sparingly furnished with them. It is not only in point but very contradictory that being positively to the mammals, which can assist us in explaining the necessity for these appendages to their lymphatic system." (*Vol. 1, p. 104.*)

Muller's theory that the lymphatic glands had a tubular covering, which entered them to act as organs of propelling the lymph from their cells into the veins externally, and thence towards the thoracic duct, so that they were, according to his notions, like so many little hearts distributed through the system. This hypothesis, which is contradicted by anatomy, requires no contradiction even observation in the living animal. If it were true, we should expect to find the duct larger, and not so large as to render even their entrance to the human absorbent glands a questionable point; were pulsating observed, with or strong, would be perceptible in the situation of every superficial gland; or, if the contractile uses of a gland, the gland would sometimes be enlarged, and sometimes considerably reduced. Yet none of these circumstances prevail. It is likewise to be remembered, that no jet of fluid takes place from the vein externally when they are cut, as they frequently are in surgical operations.

It is now to be taken into consideration that fishes are destitute of lymphatic glands (*see Anatomist's Comparative Anat. by Lawrence p. 616.*) yet the fluid in their lymphatic vessels must be provided to supply the use of the system. In the necessity of a vessel, no glands are observable; still, "in this animal, nature does her business as well, though the apparatus is differently constituted." (*Recherches Exp. Imp. vol. 2, p. 60.*)

It might be hypothesized in themselves, decidedly contrary; and whatever difficulty we may feel in agreeing with Bidder, that the absorbent vessels are destitute of several contractility, we can have no hesitation in adopting this conclusion with respect to the absorbent glands, considered as solid organs, without any reference to the nature of the properties of lymphatics within them.

The existence of a white thick fluid in the lymphatic

not larger (less a pin or two); but others are as large as an orange, and weigh four pounds.—See Minors's *Medical Atlas of the Human Gall, &c.*, and *Medical Chir. Digest*, vol. 4, p. 185. Morgagni saw one which appeared to him a misshapen finger, and Goussier, Guartier, Harnemann, Marcard, Oltz, de l'Acad. Royale de Chir. t. 7, p. 10, and others, have seen numerous of this nature, which were too bulky to pass out of the system without surgical aid. In certain examples, recorded by Harnemann and Harnisch, the passage of the concretion upwards towards the splenic and Hepatic veins of one concretion which was as large as an apple (*Epist.* 1. 2, tom. 2, Dig. 2, p. 237, and *Marcardi Anat.*, *decanat.* (*Schneider's* *Verh.* *Anatom.* t. 2, p. 127). Bland, Nesome, and Boyer give the particulars of some examples in which the concretions discharged very as large as a hen's egg. Mr. C. White extracted two from the rectum, which were nearly as big as the fist (*Ann. of Surgery*, p. 18); and in a boy, who died in an emaciated state, after continued pain in the abdomen, attended with frequent attacks of delirium, Mr. Hay found in the transverse vein of the colon so large a concretion that it could not pass any farther along the bowel, and appeared to have been the sole cause of the boy's death.—(*Practical Obs.* in *Surgery*, p. 598, ed. 2.) An analogous case is also reported by White (p. 28). It is stated in the *Ann. de l'Acad. de Chir.* that Dupuytren saw a concretion that had been discharged, which was two inches and a half in length, one inch and a half in diameter, three inches and a half in circumference, and the weight of which was three ounces and a half. But, judging by their weight, how much larger these must have been which were seen by Serapellus and Lettices, and which he describes; that reported by Dolans, which weighed two ounces; that recorded by Ormsby, which females weighing two ounces and a half; and is said to have been eight inches in circumference, and to have been taken out by force; that recorded by Schmidt-schmidt, which weighed four ounces; and lastly, the specimen, cited by Vissagius (*Litteratur. Med.* Dig. vol. 1, p. 151), the weight of which is alleged to have been half a pound.—See *Med. Wahn.* vol. 8, p. 125. It is observed by Hunter, that although examples of alvine concretions being discharged by vomiting are not so frequent as the foregoing cases, yet they are not infrequently met with. Many of these have been collected by Schlegel, and others are collected by Frey (*Pha. Trans.* No. 429). He attributes to the stomach, by Marshall, (*Quart. Journ. of Nat. Hist.*, par. 1, in *Vol. de l'Encyclop.* *Medica*, 1781), by Boissier, and by a long list of other writers, whose names and publications are specified by Ponsard.—(*Ed. Med. Dig.* art. *Calculus Vesicae*, &c.) With due care of observation, says Kuhn, may not be enlarged these concretions which are found upon dissection either in the intestines or stomach, whence probably in time they might have been expelled. Some of this description are recorded by Portal, Vey, d'Auvergne, Jaccard, &c. The cases related by White and Vey, in which the cases are completely abstracted, I have already mentioned; and to these may be added the instance quoted by Hunter, in which "Morgan found the jejunum entirely blocked up by a singular concretion.—See *Person. medic. varia* (p. 18) a *matra de calculis* calculeis, the concretion calculeis opacis, et rubis granulis, *Memor.* p. 5 and 6, 46. Vienna, 1825.

It is also observed that, with respect to the origin of alvine concretions, whether discharged from the alimentary canal upwards or downwards, some of them appear to be formed in that canal itself, while others pass out of it from other situations; and they all admit of being distinguished according to the place of their origin, and formation into three kinds: 1. hepatic, or biliary; 2. gastric, or intestinal; and 3. (what this author designates, as *matra de calculis* calculeis) alvine concretions, as the name implies, are derived from some part of the hepatic system; the portion, is intestinal, are formed within the alimentary canal; and the named concretions in the hepatic system, but afterwards get into the *caecum*, where they acquire an increased size.

On the subject of hepatic concretions, or biliary calculi, or gall-stones, as they are usually named, there is no point of the system where they do not sometimes appear.—*Epist.* Bland found them in the surface of the liver.—*Ed. med. Wahn.* vol. 8, p. 125.

A woman's very adhering to the protracted covering of her liver, and a woman's case is reported by Bouverie. Tait, Bouverie, Bouverie, and Bouverie have seen calculi within the substance of the liver; while Bouverie, Palfogian, Goussier, Bouverie, Bouverie, Bouverie, and Bouverie, several examples, in which the concretions were in the paracystic of the organ. Bouverie, Bouverie, Bouverie, Bouverie, and Bouverie have seen them in the biliary ducts, or probably were those which Goussier and Casanova may they found in the same cases. Whalley and Dietrich found calculi in the ducts hepaticus; Bouverie and Goussier in the ducts cysticus; and Bouverie, Goussier, and Bouverie, in the ducts cholelithicus. Goussier, Bouverie, Bouverie, Bouverie, and Bouverie have seen calculi in the ducts hepaticus, and Bouverie have seen calculi in the ducts cholelithicus, attached either to the liver or the gall-bladder. The place, however, where calculi are found in the greatest number, and with most frequency, is the cavity of the gall-bladder itself. Here they are sometimes single, their size varying up to a magnitude completely filling that cavity, as says Bouverie, Bouverie, Bouverie, Bouverie, and Bouverie have seen: while sometimes their number amounts to a hundred, or even a thousand, of different sizes. Bouverie possesses a gall-bladder, which contains above a hundred small calculi, and formerly I had a similar number, which I found in the body of a female. Van Swieten met with a hundred; Hunter, a hundred and forty; Stiller, two hundred; P. Tait, three hundred; Whalley, five hundred; Morgagni, seven hundred; Bouverie, a thousand; Hunter, seven hundred; Paul, sixteen hundred; Beck, two thousand; and Bouverie, several thousands.—*Bland.* *de Pathol. Anat.* t. 2, p. 401.

All hepatic concretions, however, are not calculated to pass from the place of their origin into the intestines, but only such as are situated in the ducts hepaticus, or its main branches, in the gall-bladder, the ducts cysticus, or the ducts cholelithicus. When their size is not disproportionate to the diameter of the ducts, they pass with facility; but, when their dimensions are larger than those ducts can naturally admit, the latter become stretched and dilated, whence arise the sharp pains and crises which attend the disorder, analogous to the sufferings produced by the descent of large stones from the kidneys to the bladder. The cavity of these dilatations of the hepatic ducts is generally disposed. Bouverie found the surface of the ducts cholelithicus, which is usually very small, so much enlarged that it could receive a finger; and Van Swieten saw this duct enlarged through its whole extent to a similar degree.—*Med.* in *Boissier's* *Epist.* de *Medic.* vol. 1, p. 150. Goussier, in describing a body, found the ducts cholelithicus so dilated, that it resembled a kind of bag, in which several calculi were included. Mr. Thomas saw alvine stones two cases, in which the point of the two finger readily passed from the cholelithicus into the gall-bladder.—*See Med. Chir. Trans.* vol. 8, p. 165. Bouverie saw this duct so much enlarged as to admit a couple of fingers, and he found many alvine concretions from Bouverie, Tait, Vey, and others. We may conceive how dilated this tube must have been in a case recorded by Richter, where, though it was not completely obstructed, a calculus weighing three ounces and a half was lodged within it.—*Bland.* *op. cit.* p. 7-15.

With regard to these concretions which are distinguished by the epithet gastric, or intestinal, some are formed in the cavity of the stomach; the rest in one or other of the intestines. They remain for a greater or less period in the place of their formation, according as they happen to be lighter or heavier, smoother or rougher, more or less adherent, or as the local general circumstances are more or less favourable to their retention or expulsion. Sometimes, they continue undisturbed until they have attained a very considerable size. In particular instances, instead of remaining constantly in any place, they successively pass through the whole intestinal tube, lodging at different points for a greater or less time. In the works of Hunter and Keen may be seen representations of the points of the intestinal canal, where these concretions have been found. The white substance, of which Morgagni has given an account, was some years in traversing all the convolutions of the bowels. These gastric or alvine concretions, which are very common in animals, are less frequent in the human subject, as is proved by the observations of Vossius

and Vaquaria, inserted in their valuable essay on this subject in the *Annuaire du Muséum National d'Histoire Naturelle de Paris*. In the latter they are accumulation of an inorganic kind, there may derive from an irritation not proved, in which has conception revealed *Barrois gemmæ*.—Voigt, *Monatsschrift für das Naturwissenschaftliche*, 6, 3, p. 575.]

As for the third species, which Rabinus named, and, as hepatic gemmæ, they have still been regarded in the hepatic organs, and assigned to the hepatic tubercles. Here, if the tubercles only be enlarged, and the contents of the vessels have a disposition to become thickened, and condensed round it, as a nucleus, it may be troubled larger by additional strata of matter, and would increase steadily, if a stop were not put to the accumulation by the narrowness of the canal, or in other mode. For the expansion of the concretion. Stages are also two instances of this sort of concretion; one from Glands, the other from Bile; and he gives his opinion that another alvine concretion, spoken of by Valet, must have been of the same nature. Dr. Cos. describes another interesting specimen, and others are referred to by Van der Meulen, Mucosa, Pott, &c. Perhaps, says Rabinus, the homogeneity of this kind would have been more transparent if all the concretions discharged from the bile had been mixed with greater uniformity, and the hepatic gemmæ distributions not associated with the hepatic. The judgment of these concretions in the intestinal canal is of singular duration, and depends upon a variety of circumstances. Van der Meulen gives the history of a calculus, which, as far as could be judged of by the path in the right hypochondrium, and the change of symptoms, must have passed into the duodenum in the month of January, and then continued in the bowels until August, when it was discharged from the rectum.

The crystalline appearance of alvine concretions is generally so conspicuous, that it has not escaped the attention of several of the old writers, as we may convince ourselves by referring to the Works of Gern, Gern, Girard, Berget, Berthollet, &c. It was noticed by Haller in his *Elementa Physicæ*, vol. 6, and by Morgagni in his *Epist. 31, de Solidis in Cæca, &c.* It says Rabinus, these crystallizations are not always plainly visible, and regular, but depends either upon their impurity, the heterogeneous nature of the accumulated matter, or perhaps on unfavorable circumstances, which would equally affect the process of crystallization out of the body.

Now, as all crystallizations depend upon the fluids in which they form, and from which they receive their crystallizing elements, it must be evident that, inasmuch as the fluids of the hepatic organs differ in their constituent principles from the fluids contained in the intestinal canal, the concretions produced in the first system must differ from those originating in the second; while the hepatic gemmæ itself will contain the nature and properties of both systems.

The first three which hepatic concretions are formed is unquestionably the bile, either some of its ingredients entering into their composition. Indeed, previously to the new chemical doctrine, hepatic calculi were generally considered as being simply condensed undigested bile.

From investigations made in more modern times, however, when the art of analysis has displayed a technique of which the old chemistry was not susceptible, it appears that although human biliary calculi yield the same products as the bile, there is contained in them more or less of a peculiar substance, which was named by the celebrated Pott, *alopoein*.—*Mém. de l'Acad. des Sciences*, 1769, p. 223. The presence of the substance in the constitution of such important bile, when it is situated in and in large proportion, the colored is regular and the crystallization well marked; and when it is in small quantity, the crystallization is confused and disordered, the crystals only exhibiting an irregular weakly concretion, more like a clot than true crystals. The kind of alopoein constituting the base of all human biliary calculi, had some resemblance to spermaceti. Both Fourcroy and Dr. Berthollet, who analyzed it, found it composed entirely of carbon, hydrogen, and oxygen. It melts, but requires a heat superior to that of boiling water, burns a flame like a seed, and has cooling power. Burns a substance, which besides was crystalline. It is not soluble in alcohol in the cold; but when the al-

cohol is heated on it, it is dissolved in a proportion according to Berthollet, of one part in sixpence—according to Dr. Berthollet, one in thirty.—*Nature's Journal*, 1801, vol. 4, p. 127. The substance, when it boils, deposits light whitish scales. It is soluble in ether in the cold, and more abundantly if the ether be heated. But as hepatic concretions dissolve in ether, and, according to them, it dissolves those which contain almost entirely of this peculiar matter; yet Dr. Berthollet has remarked, that oil of turpentine acts on it with difficulty, and even when digested with it, at a boiling heat, dissolves it only in a small degree. Pure oils and potash dissolve it completely, and reduce it to a saponaceous mass. As regards, as Dr. Berthollet has remarked, seems little soluble in vinegar when boiling. Nitric acid dissolves it, and, according to Fourcroy, converts it into a species of liquid similar to the oil of turpentine. This becomes concrete, but without any crystalline structure, and is more soluble in ether and the alkalis than the original matter.

The substance (Fourcroy has observed) is considered as greater or less generally in nearly all human biliary calculi, more or less impregnated with other matter, but still in its proportion as to these other bases. Hence, they partake of its properties; are fusible, inflammable, and more or less soluble in the agents which dissolve it.—See Murray's *System of Chemistry*, vol. 4, p. 594, ed. 5. Fourcroy, on exposing the three principal substances to the action of dryness, within the acid, saw it whitened; and afterward restore its former silver lustre. However, Rabinus repeated this experiment, and found that the whiteness which was contracted remained permanent.

While the hepatic system contains a fluid which is always partly of the same quality, viz. the bile, the accessory canal, as Rabinus observes, contains a less and different fluid, but is continually supplied by distillations of various nature, kinds, and properties, consisting of food, drink, and several secretions. All the principles which are so service for the formation and renewal of the different species of living solids, and of the many kinds of fluids, as first means more or less than in the alimentary canal, and these undergo peculiar changes. All the principles which, under different circumstances, may contribute to the production of natural concretions, either in the gall-bladder, the crista bladder, the kidneys, or in any other part of the body, where they ever occur, take at first into the intestinal canal, where they continue for some time. Such a multiplicity of principles, disposed to crystallize, and be converted into calculi, would very often, almost daily, produce these concretions in the bowels, were there not many circumstances which counteract this tendency. As, for instance, continue, the incessant motion of the matter itself, which the intestinal tube, the variety of these elements, whereby their reciprocal tendency to union is disturbed, and the decomposing and recombining influence of the gastric secretions, whereby parts are seized, disposed of, dissolved, and analogous matter kept divided, &c. But whenever these circumstances are not actively operating, as may be the case in a morbid, or old of the bowels, or in some preternatural case belonging to them; whenever the intestinal fluids undergo such an alteration that the production of these concretions cannot be prevented; or, lastly, whenever some favorable circumstance, such as an extraneous nucleus, forms a centre of evulsion for particulate elements; then the nature matter, which is most disposed to crystallize, and the earthy and mucous substances, &c., are attracted together, and produce more or less perfect crystallizations. A chemical analysis of some intestinal calculi, furnished by Koenig, and afterwards by Stern (Philosophical Transactions), proves that when they are exposed to a strong heat in distillation, they yield water, ammonia, and a thickened oil, a rigid membrane remaining behind. Under identifying a singular conversion, fluid, or solid, to the above products, phosphorus. The materials of concretions was afterwards discovered by Goubern, Fourcroy, and Vaquaria, in their analyses of the intestinal concretions met with in animals, describe them as composed of the anhydrous phosphorus of lime, phosphoric acid, and of the anhydrous phosphorus.

Some specimens contained in the Edinburgh museum were very carefully examined by Dr. Thomson: they at first soften in water, but afterward sink;

the specific gravity varying from 1.275 to 1.285. Distilled water, stirred from time to time with glass, and with glass, which separated in white flakes by boiling. These were also a peculiar brown substance, at first dissolving in water, but rendered nearly insoluble by more evaporation; soluble in alcohol, and most easily dissolving in vegetable extract. The specimens likewise contained minute of soda, crystallizing on spontaneous evaporation of the water; phosphate of lime, precipitated by ammonia; sulphate of soda in minute quantities; and, perhaps, sulphate of lime. Alcohol dissolved the peculiar brown matter and some of the soda; caustic potash, the albumen, brown matter, and perhaps some of the soda; and acetic acid a proportion of phosphate of lime. After all these remained a peculiar substance, having the color and outline of the calculus; in very short threads, soft, resembling silk, or rather wool, brittle, dissolving in water, alcohol, ether, petroleum, and nitric acid; being blackened, and partly dissolved by charcoal by sulphuric acid; slowly dissolving by heat, without effervescence, in dilute acid; and losing on evaporation a whitish residue, of longer taste, and imperfectly soluble in water; leaving with a bright flame; but dissolving on other animal and vegetable substances in some quantity, and disappearing from wool, by its insolubility in potash-ley. The calculus consisted of alternate layers, or concentric strata of this substance and phosphate of lime, in which the albumen and brown matter served as a cement, the other substances being in small proportions. Phosphate of lime mixed with a brown viscous matter, formed the external crust of some of the specimens. On the surface of a few were spotted crystals of phosphate of ammonia and sulphate. The presence of another porous, amorphous, carbonaceous of lime, urea acid, nor less could be detected.

Varieties have also been found by Dr. Harey and Mr. Berard, exclusively opposed by congress, of which the present has been in the habit of taking vast quantities.—See Thomson's Obs. in Medical Anatomy of the Human Urine, &c. p. 36, 37, in Medical Jurisprudence, vol. 1, p. 188, 189.

From observations made by Dr. Wallston, it appears probable, that the above thence light, though substance is derived from urine, which are so commonly taken as food in Scotland.

"If the calculus is directed in its length, as stone pebbles or beads, forming a small length, are seen placed at one of its ends. Dr. Wallston, observing these angles and comparing them with similar ones detached from the calculi, and forming the most solid in structure, situated behind, beyond all doubt, of their perfect solidity."—Marrat on Calculus Interstis, p. 124, 125, London, 1807.

The specimen analyzed by Dr. Ure, he ascribed to be a malformation of the bladder.—Hist. of Chemistry, art. Intestinal Concretions.

As the nature of hepatic-gastric calculi, they have further noticed a bilious character, regard which other substances contained in the bowels adhere; hence, it is evident, that as they are formed in the bowels, so they are two different, sometimes, and among various kinds, two distinct compositions must be the result. Although, says Rastor, there has hitherto been no scientific analysis of this species of calculus, respecting the very imperfect one by Merz, upon whose views, really wrong, that, if two separate analyses were made, one of the calculus, the other of the surrounding matter, there would be obtained from the waters the same results as those of the hepatic calculi, and from the rest those of an intestinal concretion.—See Ponsard's Essai sur l'Origine, &c. de l'Opacite des calculs de la vésicule de la bile, p. 25—27.

As the same subject remains, the foregoing principles will enable us to determine with greater precision than formerly, the characters which appertain to the several classes of calculi. It will be noted from the internal view; characters, by means of which these can be so differently in dividing, from the appearance of one of these concretions, the place of its origin, and its peculiar nature. The hepatic calculus being composed of bile, and also of albumen, its characters will be such as indicate the predominance of a bilious, sanguineous, and white fluid, and a well organized principle. The gastric or intestinal calculus, arising

from the masses of viscous mucus, curdles, and other principles, which happen to be at the alimentary canal, will have very different characters, generally indicating its gastric, or intestinal composition. Lastly, the hepatic-gastric calculi will present a union of the different characters, viz. in the common, the characters of the hepatic calculus, more especially, than of the gastric.

The criteria for distinguishing the several kinds of calculi from each other may be divided into such as may be termed external, being derived from accidental circumstances attending the foreign body; and others, which may be called internal, being derived from the internal characters belonging to the composition and nature of these concretions.

The first of these external criteria is the age of the patient. C. Scapellato, Hoffmann, Bouchard, and Morgagni of ages, their history, external signs, except in subjects of advanced age, and never in youth. And Haller writes, "Quatuor et prope, quantum cum, in aetate adulescentia." Morgagni met with only one old person who had alvine concretions, but without eight young persons, not one of whom was above the youngest being twelve years of age, and the oldest twenty-nine. To these I may add the instance reported by Boyl, in which a stone as large as a hen's egg was found in the gall-bladder of a young female aged only twelve.—See Journ. des Savans, Sept. 1807. The cause of this difference is attributed to be explained by Morgagni; but, perfectly, a more rational explanation than that supposed by him, will be found in the analysis of the title of old and young subjects, we made by Ponsard and other modern chemists. From these and other observations, offered by Rastor, it is rational to conclude, that when an alvine concretion is discharged from a young subject, the organs are, that it is not a bilious one; though, if the patient be of advanced age, it is not to be inferred, that the bilious nature expelled must certainly be bilious, because gastric or intestinal concretions are common in individuals of every age.—Rastor, op. cit. p. 13. Indeed, with the latter kind of calculi, men of advanced age and women are said to be most frequently affected; children and young persons rarely suffering, unless the formation of such bodies has been produced by the presence of flatulency, or other indigestible substances, which serve as nuclei.—Rastor, Nouveau Cours, t. 2, p. 125, ed. 1. These concretions are also sometimes formed in patients who have been confined by disease a long while in a protracted posture.

The second criterion is derived from the symptoms, which precede or accompany the expulsion of the calculus. Sense of heaviness, irritation, and pain in the region of the liver, pain along the mamma cartilage and navel, bilious swelling, jaundice, and other symptoms of the bowels or constipation, are the symptoms which, especially when they frequently occur, indicate the hepatic origin of the calculus, and proceed thus ascending through the narrow ducts of the liver calculi towards the intestines. The most careful observations takes place, however, that these symptoms are only to be depended upon when taken collectively, and that no single one gives any certain information. Also, if their presence be sufficient to prove the hepatic origin of the calculus, their absence can by no means be regarded as a proof of the concretion being of the intestinal kind.—Rastor, p. 13.

Third criterion. A calculus voided may be set down as undoubtedly hepatic, if accompanied by intense jaundice of the nature. It is also recorded by Harey, and in another by Vater, the absence of common symptoms in the first, and the magnitude of the calculus in the second, united decide whether the concretion were not more likely to be of the intestinal kind, than of the hepatic. At length, the bodies having been opened, the presence of other similar calculi in the gall-bladder afforded an adequate criterion.

Morgagni has done a fourth criterion, deduced from the number of the calculi voided; which, if very numerous, are to be considered as bilious. Balthus writes, however, the fallacy of this test; both hepatic and gastric concretions being sometimes single, sometimes in various numbers, from up to a thousand, and he refers to a case where a very large number of concretions of the gastric description were voided, as reported by Kozig. The test here suggested, therefore, may be considered as generally valid; for, the number of in-

testinal concretions is rarely more than two, though sometimes very considerable.—(T. Thomson. See Med. Chir. Journ. vol. 4, p. 180.)

I shall now follow Botta, and name three characters of alvine concretions, which he calls internal, and are deduced from their quality and composition, beginning with the criterion furnished by the use of the extraneous substance voided. As the bilious facts are rare, it is obvious, that if the calculus be above a certain size, it cannot have passed in that state undissolved through those narrow tubes, and consequently must be either of the gastric description or fecal, having passed the hepatic system whole, and, after being increased within the alimentary canal. The question, as Botta means, this criterion has no considerable weight, especially when the discharge of the calculus has not been preceded by pain, or other symptoms indicating such violent obstruction, as the above facts must have suffered from the passage of the foreign body. These are certainly evidence of being diluted in a transitory degree, as some facts already noticed in this article, sufficiently prove; but such dilution can only happen, without pain, irritation, and a serious pain of sympathetic efforts. Botta remarks, this criterion will only apply to large, and not to dissiminate concretions. A bilious calculus, as previously said, was found by Mr. Rogers, of Barbours, to have passed by absorption directly from the cavity of the gall-bladder into that of the duodenum, whence it was voided from the anus.—(See Med. Hist. Trans. vol. 14.)

A second criterion is the colour of the calculus; a test advised by Mead, who asserts, that bilious calculi are yellow or green, and intestinal ones grayish brown or black. But, says Botta, one need only look at various specimens of alvine concretions, and read the statements of authors who have given great many of them, particularly Morgagni and Boerhaave, to comprehend, that this criterion deduced from their colour is most fallacious, every species of them presenting great variety in this particular. And it is to be remembered, that the bile and the intestinal fluids, whence these concretions are formed, differ in colour in different individuals, according to a variety of circumstances, in health and disease. And species of hepatic calculi has a white colour, but is sometimes yellow or greenish. Alveoli is of a round or poly. round shape, and often of a gray colour externally, and brown within. A third is of a deep brown or green colour.—(See Doct. Dict. of Chemistry, art. Gall-stones.) The small intestinal concretions, examined by Dr. T. Thomson, describe a coating, resembling lead yellow colour; the larger were varnished with an earthy matter, or a yellow colour, and purple or sometimes white.—(See Memoirs on the Human Gall, &c., and Med. Chir. Journ. vol. 4, p. 185.)

Third criterion. The progress or absence of a reaction will enable one to judge whether a calculus be gastric or hepatic. A bilious concretion can no longer, properly so called, that is to say, it has no foreign body in its centre. When a transitory matter is made of such a calculus, one finds either a cavity in the middle, or the getting by which this part of its substance can be distinguished from the rest; or if a reaction different from the other part of the concretion is apparent there, it contains pieces of bile, either greenish, differently coloured, or more or less fluid than the rest of the calculus, but which is nevertheless invariably true. On the contrary, every gastric concretion has, still were, an extraneous matter, as Flucrocy and Vissaghi have explained in their own way the intestinal calculi, then within its middle. Botta, in the Med. Trans. gives an account of some alvine concretions which were found round pieces of wood. Botta himself, in example of a crystallized calcareous foreign body, a broken bullet. Had he not with a calculus in the course of which was so firm and. Extraneous bodies upon fruit-stones are recorded by Clarke, White, and Hey, and also in the Ephem. Med. Histor. And some in which the nucleus was a small portion of bone, and Vissaghi, Flucrocy, and others describe alvine concretions formed round calcareous extraneous matters, and many similar cases are specified by Vallisium, Van Meenen, and others. In the hepatic-gastric calculus the bilious concretion seems at a nucleus for the gastric. According to Dr. T. Thomson, the nucleus is commonly a cherry-stone,

a small piece of bone, or a bilious calculus.—(See Med. Chir. Journ. vol. 4, p. 185.)

A fourth criterion is deduced from a certain similarity which belongs to bilious calculi, but not to those of the gastric class. This similarity is more palpable when the calculus has been recently voided, or when it is loaded with warm faeces. The similarity is still more evident when the concretion is cut or broken, as then the knots, saw, or fingers become smeared with superfluous particles, which adhere to them. In order to dissolve an hepatic calculus, however, the necessary heat, perspiration, and substances, and not merely a four tenths its volume, for a gastric, vesicular, or other concretion may by accident become coated, as it passes through the bowels, with a stratum of bile or superfluous matter. When the similarity is detected externally, or in the examination of a calculus, but is found in the interior, it is a clear indication of the hepatic-gastric formation of the concretion.

Fifth criterion. The specific gravity of a calculus, the property which it has of floating or sinking in water, has been long considered as a test of its species. The hepatic calculus is generally specifically lighter than water, as most city substances are; on the contrary, gastric calculi are specifically heavier than water, like all varying matter, and of course sink in that fluid. This criterion was often employed by Boerhaave, Ferrius, and others, for distinguishing various concretions. But it is of no more use, as many bilious calculi weigh only a little more than their bulk. The specific gravity of that analyzed by Dr. Ford of Glasgow, was 1.010.—(See Med. Chir. Journ. vol. 4, p. 172.) As Botta observes, this test will not answer for hepatic-gastric calculi, which are subject to great anomalies.—(Ponsen, Art. p. 21.) Nevertheless the most correct modern investigations prove, that gastric concretions have a specific gravity varying from 1.376 to 1.541.—(Dr. T. Thomson in Mead's Med. Ann. &c., and consequently their general character is to be heavier than bilious calculi.)

A sixth criterion is that proposed by Vign d'Ange, in the Mémoires de l'Académie de Médecine, and deduced from the figure of the crystallization. According to this writer, intestinal concretions crystallize in concentric layers, shaped like a rock's creek, when the crystallization of bilious calculi is indicated and well-developed. Although this criterion is necessarily founded upon the known laws by which every crystallized substance acquires a peculiar and determinate shape, yet it may be generally observed with respect to the mark of distinction here proposed, that the concretions of which we are now speaking are usually too irregular, and too much disturbed in their crystallization to exhibit a regularity, for which simplicity and gradual are indispensable. Hence many of these concretions do not present the slightest vestige of crystallization, while others scarcely show a trace of it, in the shape of a large quadruple mass. The white-colored hepatic calculus when broken is said to present crystalline plates within, brilliant and white lustrous. The round or polygonal one which is often of a gray colour externally, and brown within, is described as consisting of concentric layers of compressed bile, usually with a nucleus of the whole crystalline matter in the centre. Lastly, the hepatic calculi, of a deep brown or green colour, when broken, are said to exhibit a number of crystalline the calcareous crystalline fragments, filled with impregnated bile.—(See Vign d'Ange, art. Gall-stones.) With respect to the special shape assigned by Vign d'Ange to the two classes of alvine concretions, it may be observed that the specimens we speak of from animals, and that consequently the inferences made from them are not applicable to calculation of an analogous nature discharged from the human body, because, as the bile varies in different animals, so must the fermentive principles of the calcareous crystallizations. It is further remarked by Botta that the calcareous termed alveoli, which is the basis of bilious concretions, was not found by Needham in hepatic calculi taken from birds' nests.

A seventh criterion is founded upon the inflammability of an alvine calculus. A bilious concretion being necessarily made up of compounds of fat, resinous matter, together with sulphur, or heat, and other acids, and other. When this compound is made in close vessels, the products are hydrogen, carbonic acid gas, oil, and ammonia; some caloric and much remaining

restoring the active secretions from the nervous energy as long as his life. When the system has well and flows the contractions as he takes out, the muscle would be divided at its posterior angle. According to Richerand, such a division does not permanently weaken the fibres to a perceptible degree, and the paralysis seems to originate from this cause.—(Nouveau, *Chir.* t. 3, p. 428, etc.; 4.) Macleod, affirms proper division, with excision, extracted from the nerve an above circumference which weighed four ounces and a half, and was of an oval form, the granular character being two inches eight lines, and its surface was such seven lines.—*Nov. Mem. de l'Acad. de Chir.*

A. PETERMAN, *Scrittura sopra le palpebre venute Pella, con alcune nuove cagioni singolari.* Lips. 1698. Also HALL, De Calicula Felina Propagationis Observationes, 4to. Gyn. 1741. W. COE, A Treatise on Blurry Vision, 8vo. Lond. 1757. Italian, De Visione Calicula Felina Specimen, 4to. Rom. 1759. De Visione, Diss. de Calicula Felina et oculorum, 4to. Rom. 1760. Trill. de Rom. 1769. Whether the Concomitant Tortionism is a violent parietal out-pulse transmits reports. *Phil. Acad.* 1773; the most valuable work on the subject at this period. Haselstern, the Chirurgical Hermaphrodite, 4to. Tets. 1782. VOGT, *Chir. Hist. de la Société Royale de Med.* 1779. A valuable production, particularly with reference to the kinds of strabismus observable in female and infantile children. HERNANDEZ, *Memorie sur les pelves bilaires, et sur l'effluve de reflux de l'utero vithiques et de l'ovaire de l'uterus dans le colage.* Republique produite par ses observations, vol. 1 des *Mém. de l'Acad. de Chir.* 1801, p. 183, et 1783. R. T. SCOTT, *Observations on Concomitant Strabismus corporis humani.* 8vo. Trill. de Rom. 1793. B. SPRING, *Essai sur les Calicula bilaires, de Paris.* 1801. JACQUET, *Mém. de l'Acad. des Sciences.* 1788, et 1794. Des Concomitant Chir. v. 10, p. 62—69. Dr. BERTSCH, in *Nicholson's Journal*, vol. 4, p. 137. MARCET'S *Classical History and Modern Treatment of Calicula Bilaires.* 8vo. Lond. 1867. J. F. MCKEL, *Handbook of Pathol. Anat.* h. 2, p. 495, 496. LEIGT, 1818. P. HENRI, *Pensées sur la nature Originale de la Nature de Corps caliculae qui vengent l'ovaire de l'utero de l'utero Gyneco.* 4to. Vienne, 1808. JAMES GRIFFITH, *An Account of a Medical Association discharged from the British, and in its Chemical Strabismus, newly describing Amblyopia, with Historical Remarks.* *Medico-Chir. Journal*, vol. 4, p. 17, 48, 1807. MASON'S *Medical Anatomy of the Human Gland, Structure, and Functions.* 8vo. Edin. 1811. The account of strabismus in this work is one of the best and most comprehensive. Dr. J. J. GIBSON, *Med. Hist. de l'Acad. de Chir.* 1811. Nothing of much consequence in either of these articles. HERNANDEZ, *Diss. de Calicula Felina Propagationis Specimen.* 4to. Rom. 1759. *Observations sur les pelves bilaires.* 4to. Rom. 1760. Cases in Surgery, by C. WHITE, 8vo. Lond. 1776, p. 17. PHILIP, *Threatened, vol. 3, p. 126, et seq.* Edin. Med. Times and Obs. vol. 1, p. 365. Edin. vol. 3, p. 421. EMMETT, *Phys. and Surgery*, vol. 2, p. 345. LEIGHT'S *Natural History of Lenses*, plate 1, fig. 4. W. HAY'S *Practical Observations on Strabismus*, p. 367, et 9. RICHARDSON, *Neurographic Characters*, 1, 2, p. 423, et 5. THOMAS in *Med. Chir. Transactions*, vol. 8, p. 85. T. BROWN, *An Account of Two Cases of Bilary Caliculae of extraordinary Dimensions.* *Med. Chir. Trans.* vol. 12. *British Medical Journal*, *Intestinal Concretions and Gall-stones.*

AMAUROUSIS, (Passio) *impedire* to darken or obscure. Oculi strabismus. Oculi strabismus. (Et. L'Amateur.) Bern. Schönerer Star. According to Boer, the term amaurosis properly means that darkness or total loss of sight which immediately depends upon a morbid state of the retina and optic nerve, whether this actual state exist as the only defect, or be combined with other defects, whether it be a primary affection, or a secondary one induced by previous disease of other parts of the eye. He may say, with a typical variety, that the term amaurosis designates all affections of the nervous vision, which produce either complete or partial loss of sight, whether this arise from strabismus or other organic disease, from a luxation or loss of sensibility in the eye, which direct be traced to change of structure or any other evident cause.—*Nov. Journ. de Med. et Chirurg.* vol. 4, p. 166.

The definition given by Mr. Lawrence in his *Lectures* appears to be correct and comprehensive. Amaurosis and pama strabismus, he remarks, are names applied indistinctly to those forms of strabismus which result from

an affection of the nervous sensitive of the eye, whether it be seated in the retina, optic nerve, or elsewhere; or whether this affection be produced immediately by vascular congestion, inflammation, or venous clump; or indirectly by sympathy with other organs.

Even these definitions, which comprehend every form of amaurosis, it is evident that this disease does not uniformly take place as a single independent disorder, but often subsequently presents itself as a symptomatic effect of some other disease of the eye, a fact exemplified in cases of hydrophthalmia, sympathizing ophthalmia, &c. Also, as Mr. Wardrop observes, amaurosis, in its usual conception signifies a symptom of disease as well as a distinct affection.—*Lectures by the Medical Anatomy of the Human Eye*, vol. 2, p. 164, 165, Lond. 1808. With respect to the mere loss of the light of vision here implied by amaurosis, the correction will remove the error, whether the loss be total or partial; whether the eye be permanently blinded or obstructed; and whether it be perfectly clear and transparent, or more or less turbid; for the name only refers to the morbid state of the retina and optic nerve, and not to the condition of the light in passing. When the long-embodied name of amaurosis is removed with this precise meaning, there will not be the slightest danger of confounding the disease with other affections of the eye. However, when it is wished to indicate the very different forms and kinds of amaurosis, the foregoing appellation of the title and page are considerations of great importance.—*See Boer's Lettre von den Augenkrankheiten*, h. 2, p. 423, 424. Wern. 1817.

I think it also of importance that surgeons should well understand what Mr. Travers has particularly mentioned, that the term "amaurosis" comprehends all those imperfections of vision which depend upon a morbid condition, whether affecting structure or function of the nervous apparatus proper to the organ.—*See his Synopsis of the Diseases of the Eye*, p. 308.

Boer mentions four species of strabismus.

The first is a genuine, unaccompanied strabismus, the characteristic symptom of which consists peculiarly and entirely in an impairment or loss of vision, without any marked change in the organic matter of the eye. This is also the epithet "proper Amaurosis," used by Mr. Travers, would be applicable.

Secondly, there is an amaurosis, which, besides being attended with a distortion or total loss of vision, is also accompanied with appearance of disease in the organic matter of the eye.

Thirdly, there is another strabismus, in which, together with the above principal symptoms, viz. weakness or loss of sight, there are also marked phenomena exhibited in the form of the eye in general, or in particular structures, and especially in the action of its intrinsic parts.

Lastly, Boer says, he will often point out an amaurosis in which all the characteristic symptoms of the three preceding cases are more or less combined.—*See Lettre von den Augenkr.* h. 2, p. 476.

The genuine unaccompanied amaurosis, consisting of a mere impairment or loss of sight, without the appearance of any other defect, is one of the most intractable forms of amaurosis, not only because nearly all attempts to cure fail, but because they can rarely operate directly upon the optic nerve.

In the true unaccompanied strabismus, namely the simple quality of the optic nerve and retina are affected, and after doing nothing permanent can be traced in those parts either within or on the outside of the eyeball. It is, in short, the case in which the function of the retina has become imperfect or destroyed, the eye appearing in other respects sound.

According to Boer, this simple unaccompanied form of amaurosis is subdivided into that anatomic weakness of sight or blindness, which depends upon the inability or failure sensibility of the optic nerve and retina being too highly excited, and into another case, the progressive cause of which is perfectly sick entirely conformable to depression of such vitality or sensibility. The first instance is much less common than the second.

Amaurosis does not constantly attack both eyes at the same time, frequently one is attacked some time after the other, and it is not unusual, even for one eye to remain sound during life, while the other is completely blind. This depends, in part, upon the disease

tion to the disease in one eye being quite local, and is just upon the reason given true to the consistent en-
tailing their operation only to the eye affected. Where
also the origin of anastomosing vessels is dependent although
upon constitutional causes, one eye is not infrequently
affected much sooner than the other; though in these
examples, it is more rare to find the eye which does not
suffer at first continue perfectly unaffected. (Went 3,
p. 334.) As a general observation, Mr. Wadding
thinks it may be remarked, that when only one eye be-
comes affected, anastomosing from a sympathetic affection,
there is little danger of the other eye becoming blind;
but that when keratitis is produced by any organic
change in one eye, the other is very liable to be symp-
tomatically affected.—(Course on the Medical Anatomy
of the Human Eye, vol. 2, p. 180.) Anastomosing very not
completely hinder vision, a diminished power of seeing
often remaining during life. Hence the division of
nerves too perfect and unperforated; which latter, how-
ever, sometimes admit a degree in which the patient is
only just able to distinguish light, the direction of its
rays, and shadows.

Imperfect animals, besides being characterized by a considerable weakness of sight, approaching to real blindness (*Apocrypha Astruciana*), is mostly complicated with a *proptus* or loss of power of other mental associations, which merit serious attention.

Among the most important of these synoptic signs are the appearance of important landmarks in a collective or territorial sense (*visus territorialis*). For instance, when the patient is reading, single or double words, or lines cannot be seen, unless the eye be first directed to them by a movement of the whole head, and greater or less portions of other objects are, in the same manner, indistinguishable. Sometimes, stereoscopic pictures can see only the upper or lower, or the left or the right half of objects (*visus dissidialis*): *Ammonius* (*Ammonius*: *Hemipus*: *Hemipus*).

Sometimes, when the patient attacks one eye, he can only distinguish the halves of objects; that is, he opens both eyes, he sees every thing in the external form. In this case, according to Schaeffer, one eye is normal and only some fibres of the nerve of sight may be injured in the other. — (Vergessenheit Chir. Schmid, 6. 2. p. 12.)

There are likewise some not very dissimilar cases of imperfect anisometropia, in which the patient cannot see an object, unless it be held in a particular direction before the eye; but when the eye of head is turned in the lens, he loses all view of the thing, and cannot easily get light of a scene. — (Jews, *Letter from Aug. 1840*, p. 15, p. 154.) On this part of the subject, it is remarked by Brider, that persons who may be said to be entirely blind, sometimes have a small part of the retina which is still susceptible of the impression of light, and is usually situated towards one side of the eye. This elasticity of sight sometimes gets pointed out by the late Mr. Hry, as common in the present disease. — See *Med. Obs. and Inquiries*, vol. 3. Brider mentions, that in one man, who was, in other respects, entirely devoid of vision, that sensible part of the retina was situated of largely over the nose, and so small, that it was always a considerable time before an object could be discovered; he adds, that it was so movable, as not only to discover the light, but even the spot of a distant object. According to this author, it is the centre of the eye that seems to be the first and most seriously affected. Hence, the mortality of persons, who have a beginning of imperfect anisometropia, are persons, which are naturally blind, before they reach an age immediately before death. — (Anfang, p. 15, p. 154.)

[illegible]

The relative perception of various calibrations left is rapid motion before the eye, gradually increases; the

solitaneous Cataglyphis become less and less transparent, and, at length, the so connected together, they form a kind of network or paste, by which all insects are more or less obstructed. This is another symptom of antismine, technically called *verru* vulgaribus. The network commonly has the peculiarity of being black in very light situations, or when white substances are before the eye; while, in dark places, it is rather shining, red, or it seems, of a bluish white line like silver, though sometimes of a milky-yellow *glaire* colour.

A not transcribed synonym of jaggeded maddness is the palatine maddness every object indistinctly in a rainbow-like, wondrously iridescent, and generally very dancing light; while, in the dark especially, blue or yellow dusts, or very little seem suddenly to pass before the eyes when the eyelids are shut, and excite considerable alarm. (Vesta localis). Marrowygi (Heterotaxia, Pteridaria.)

In important anatomists, the acuteness of the retina may be so exaggerated that the patient shies at all very light places, particularly those in which the light is strongly reflected like the eye, and, in order just to discern in some transition large objects, he feels himself obliged always to seek shady, darkened surroundings, or to screen his eyes, not of course with a given object, or given glaucoma. This state is termed by Meier, Lichtscheu (Photophobia). Under these circumstances, it sometimes happens, that the patient for a very short time, he changes a few moments, what is very unfortunate for a more considerable period, is able of himself to discern the smallest objects in a weak light, more plainly and accurately than the best eye can hardly do in a good light. Yet, accepting at such position, the patient with the above degree of light is not capable of seeing even larger objects. This intimate of night requires the same of eyes.

Sozialismus; in the early stage of socialism, all objects seem endowed with a dense mist; while, on other instances, this mist first presents itself as a simple, essentially increasing socialism, and rarely in the form of a non-work or game; but in the present, when his blindness coincides with the same blindness, the mist finally appears for a day or two of a light gray color, and then the another day or two very black, every thing appearing as if looked at through a dense gray smoke. — *Beitr. Lehre von den Angewandten Mathem.*, S. 2, p. 499–500.

To the eye affected with imperfect vision, all objects frequently appear indistinct, but double. (Vision duplicata; *Diplopia*.) It is remarked by Schrevelius, that in the gatta strata, which seems to gradually acquire sometimes sensibility, with both eyes. He once cured a tiger of blindness, who saw the three sides of his quadruped cage; and he attended another gentleman similarly afflicted. Such cases, he observes, are brought on by a violent distention of the vessels of the choroides, where, he thinks, vision may easily arise, in consequence of the weak resistance of the tunics. In this manner, the filaments of the retina suffer pressure, and the rays of light are broken. Under these circumstances, if foreign assistance be not afforded, total and frequently incurable blindness may be the consequence. — Schrevelius met with an remarkable instance of this kind, in a young man, thirty-one years of age. When the patient made application for advice he had been blind a year. Before he lost his sight, he remarked, that after any violent emotion, his sight at first grew weak, and that objects appeared doubled or double. When no emotion was at all heeded, he saw black spots before his eyes, and at length was quite blind. The vessels of the choroid were so large as if they had been injected with wax, and every kind of surgical assistance proved ineffectual. — Vermeulen Citat. Schrevelius, p. 2, 3, 12, &c. Nov. Berol. 1768. It seems now, according to Borel, double vision only occurs when the patient looks at objects with both eyes, and it comes in some instances either the doubled or the natural eye. In the last of these circumstances, double vision only originates from the deviation of the axis of eye from the axis of sight, that is the first instance; it comes from the morbid state of the retina, next or the doubled eye. For the purpose of distinguishing both these varieties of *diplopia* from every other species of *opacitas* double vision, Borel applies to them the name of *diplopia verus*. A degree of *opacitas* (strabismus), there-

See, is a very common symptom of incipient amaurosis, particularly when only one eye is affected, for the optic nerve more or less loses the use of vision. It is owing to this loss of perception, that persons affected with an incipient amaurosis of one eye often mistake the relative distance of objects, and frequently see them reflected. (Trauer's Synopsis, p. 110.) It is less usual for the incipient amaurosis to be accompanied with what Boerhaave objects of the eye (Lacustula), which is papillary, or a convulsive, irregular action of one or more of the muscles of the eye, being evidently a reaction of the susceptible apparatus. (See Boer's *De oculo* Amsterdam, 1722, p. 87.)

They have often met with patients labouring under incipient amaurosis, who could plainly distinguish all objects which were not very small, but saw them of a different colour from their real one. For instance, red, yellow, green, purple, &c. (Vires coloratas; cupreus.) He had under his care an ancient woman, who at midday could discern even the smallest objects in a strong light; but they all appeared yellow, though no mark of jaundice could be perceived.

Amaurosis, in the early stage of strabismus, all objects appear quite distorted, bent, slanted, and, in some instances, inverted (Vires delictas; Melopsychia). Thus the face of a candle appears very long, but all every. (This is said by Boer to be constantly an antecedent sign, at the close of it lies in the brain itself.)

Incipient amaurosis is sometimes attended with considerable short-sightedness (Myopia); and sometimes with the opposite defect (Presbyopia); an infallible proof that essential changes have happened either in the transparent media or in the trunks of the eye.

Many patients, when first attacked with amaurosis, every where testify a great anxiety to have a great quantity of light, employing several candles at night, and sitting in the day-time with their backs against a window, in order to let whatever they are reading have a very strong light upon it. This excessive disposition of incipient amaurosis is induced by Boer, Lacustula.

Amaurosis may either take place in an instant, even so as to be attended with entire blindness; or it may come on gradually, that is, it may be complete in a few days of vision; or lastly, what is most frequently the case, it may be produced gradually, and several passages before it attains its utmost degree; consciousness of great moment in the diagnosis and treatment.

The type which the German authors in its course and development, is also subject to great variety, and claims the various attention; the amaurosis may either be permanent or temporary. It is sometimes an intermittent disorder, making its appearance at regular or irregular intervals. In certain examples it proceeds at particular times, scarcely all day, till a certain hour; or from one day till the next; or it is stated but every month. The attack sometimes takes place at intermediate periods. In particular cases, whether mental affection is associated with the impairment of sight. Boerhaave tells us that one became blind at twelve o'clock in the day, when the other eye, used to bear down pain. The attack always lasted twenty-four hours. On the following day at twelve o'clock, the sight went in return, and the patient then suddenly resumed the power of seeing the other eye. He would continue thus able to see for the next twenty-four hours. Whenever he took back, the disease was rapidly doubled; that is to say, the eyes then alternately remained blind forty-eight hours, and returned the power of seeing for only twenty-four. In another patient, cited by the same writer, the symptoms, during the blindness, always became disordered, weak, and turbid; but the transparency was retained in the condition of the vitreous. According to Boerhaave, the periodical amaurosis commonly depends upon immoderate affecting the digestive organs, the stomach of worms, or irregularity in the menstrual discharge. Sometimes it is plainly a symptom of a confirmed scurvy, the patient being attacked with an ordinary intermission, and blind during each paroxysm, but always regaining his sight as soon as such fit is over. (See Boer's *de Myopia*, p. 12, cap. 11.) Boerhaave tells that periodical amaurosis is rarely, if ever, in children, hereditary, hysterical, and hyperchaudral subjects. Dry-Sightless Albinus Boerhaave.

Nystagmus and night-blindness (Cecitas Corporalis) & Strabismus (eye looking more than once of the medical symptoms. But sometimes the frequency occurring first in the disease continues itself to be permanent type; and on account of its irregularity, it is then termed by Boer "amaurosis vaga," which, he says, is often of spasmodic origin, and therefore principally met with in persons liable to hysteria, hypochondria, convulsions, or epilepsy. Periodical amaurosis, when remaining, retained a certain time, often becomes permanent. (See Boer's *de Myopia*, p. 12, cap. 11.)

In amaurosis in general, but particularly when no material knowledge can be acquired of causes, and the treatment must of necessity be restricted to respiratory principles, it is of the highest importance to neglect what Boerhaave has pointed out; namely, the systematic exercises, and universal gymnastics, breathing, as a means of sensibility in the eye, is some attention affecting this organ. In moderately light places, the patient can distinguish things very well; but in a great light, he is not able to see at all. The eye is sometimes so affected, that a strong light will make it weep and become painful. Patients of this description often strive to wear a shade, however bad their sight may be.

This form of amaurosis is described by Boer as having two stages; in the first, the patient never loses sight; the symptoms not being lost till the end of the second stage. The disease always forms with great quickness, so that the limits between the two stages are frequently very indistinct.

The first stage commences with a peculiar sensation of fulness in the eyeball, joined with occasionally increasing, violent, and annoying, lachrymation, and a remarkable weakness of sight. These symptoms are soon followed by a striking, constantly increasing blindness, during which the power of vision gradually diminishes, without the slightest action being perceptible either in the eye itself or its surrounding parts. The patient, however, is always much to be afflicted consistently, on, at all events, by such symptoms of general and local plethora, and of a plethoric diathesis, as cannot be mistaken.

When the fulness of the diathesis into its second stage the weakness becomes irregular, being less violent in some vessels than others; the patient feels as if there were before his eyes a thick net or gauze, which, in a bright light, appears quite black, but in the shade, dark and shining. This net or gauze, when there is any temporary diminution of blood to the head and eyes, as, in straining at stool, is immediately rendered considerably more dense; and when such concentration of blood is often repeated, or long maintained, the density at length remains much greater than before, and, consequently, the patient suddenly grows more blind, and is very quickly entirely bereft of vision. This complete loss of sight, in the second stage, if efficient assistance be not given, is ultimately produced by the progress of the disease, even without any accidental determination of blood, though never quite suddenly. At last, all power of discerning the light is destroyed under incessant stayings lachrymation, which are sometimes weaker, sometimes stronger, and attended with a sensation, as if the dimensions of the eye were increased, and, indeed, it really feels larger than in the healthy state.

Sometimes amaurosis originates with symptoms of weakness and diminished insensibility. The sight is cloudy, and the patient finds that he can see better in a light than in a dark situation. He feels as if when he is at that time upon his eyes, and is in the habit of frequently wiping them. The power of vision is greater after meals than at the time of fasting. The sight is always clearer for a short time, after his natural power of vision ceases, such as hardness, redness, &c. Boerhaave refers to a person, who was nearly quite blind, but was constantly able to see very well for the space of an hour, after drinking champagne wine. He was retaining a, somewhat entirely bereft of sight, who was in the habit of having it restored again, he laid at home, whenever she without a quick pace, up and down her garden. The disease sometimes is seen in the case of a lady, who had been blind for years, but experienced a short recovery of her sight, on having a tooth extracted. (See Boer's *de Myopia*, p. 12, cap. 11.)

Whether the benefit arose from the stimulus of the operation, or Boerhaave is in error, or from the

reversal of an irritating cause, does not usually be complicated. A similar case is recorded by Mr. Travers, who says, that he has seen an idiopathic functional anisotropia distinctly attended by the contraction of a diseased limb, with the injury of a similar opposite and occasional slight scars on the opposite side two years before. — (*Opuscula*, p. 236.)

When the disorder is accompanied with diminished sensibility to the eye is general, Ross (see Richter, with respect to the temporary impairment of the sight after a surprising event, or striking emotional impetus; or when the patient's mind is excited with joy, or anger, though with impairment of sight, it is rare, is but of very rare formation. — see also Verch's *Traité des Affections de l'oeil*, p. 17.)

On the other hand, it may be remarked that every thing which tends to depress the passions and spirits, augments the imperfection of sight. Where signs of lowered sensibility prevail, the above-mentioned circumstances converge a transient functional impairment; the patient strongly relies from every strong light, and frequently shades his eye with his hand, &c. — (*Lectures des Anstretes*, b. 2, p. 524.)

Mr. Travers also knows patients, whose vision is benefited by a dark degree, and states, in which it is much diminished, by the continued circulation of a salt meal, and a few glasses of wine. The disorder is acute, and persons of spare and delicate habits; the latter generally. — (*Synopsis of the Diseases of the eye*, p. 157.)

According to Rost, this anisotropia differs from the preceding, by its functional being usually very slow, and its not exhibiting any traces of those two very different stages which are peculiar to the other case. It also invariably commences with the vision retinitis, or melanosis, without any allusion with a fluctuating play of light; and the eye is at sometimes considerably better, and sometimes weaker, which always depends upon the accidental operation of the above-mentioned or several circumstances. The manifestation of the eye is never continued long, while the duration of it is not only variable, but extremely and variable. It is not at all uncommon for this species of anisotropia to make its appearance at a night-blindness, because constant artificial light is again exposed to make the impression upon the diminished sensibility of the optic nerve, and consequently these patients always show a partiality to a very strong light. To such weak-sighted individuals, the flame of a candle, or the sun, appears as if covered by a dense veil, with an extended halo round it of various colours. There is no complaint made of pain in the head or eyes; and no sensation of fulness or weight is experienced in the eyelids; such low and there any signs of the disease in the structure and form of the eye, or in the action of its irritative texture; but when a low lens long continues, it is usually corrected with a designated habit.

Anisotropia either presents itself as a positive unaccompanied affection, or, at least, with the appearance of such a form of disease of the eye, depending solely upon a morbid state of the optic nerve, and compatible by a distention, or complete abolition, of the power of vision; or the disease is connected with other diseased appearances, either in the eye, or vicinity, or some other organ at a distance from the eye, or in the general constitution. When appearance with the most violent consideration, because they are the most just connected with the cause of anisotropia. According to the statement then, there is a positive local anisotropia, and a complicated anisotropia, which last may be either local or general, or of both descriptions together, and therefore named by Rost, "perfectly complicated." — (*Vol. vi.* p. 33.)

The general system of the strictly theoretical aspect of anisotropia, getting out of consideration the morbid increase, or distention of the sensibility of the optic nerve, are then described by Rost. In the first place, all morbid appearances are absent, which might be produced in the anisotropic eye by any one unaccompanied change in the texture, form, or state of that organ. Hence we are obliged to treat strictly exclusively the pathological anisotropia that has sight is bad, or quite slow, and can unaccompanied of recovery, especially in partial cases, is every position artificial in order to determine whether such anisotropia be true, particularly when the patient alleges that the blindness is restricted to one eye. Secondly, when the anisotropia is induced solely or quite formed in one eye, a

slight degree of anisotropia is or more perceptible, arising from the immobility of the patient's eye during the eye affected upon any object. Third degree of anisotropia is noticed by Adelman and Fischer as the worst sign of anisotropia. — (*See Klinische Anstretes von Jena*, a. 1, p. 141.) And it is particularly pointed out by Richter as an inevitable attendant upon anisotropia. The patient, says he not only does not turn either eye towards any object, in such a manner, that the object looked at is in the axis of vision, but he does not turn both his eyes towards the same thing. This was pointed by Richter as the only symptom which we should trust, where imperfect anisotropia should not be put in the more assurance of the patient that he is not well, while all the signs and symptoms of anisotropia present their natural appearance. — (*See Anstretes*, b. 2, p. 141.) Fourth degree of anisotropia is noticed by Richter as the most interesting to the history of anisotropia, anisotropia being a constant affection of nature, many of which, however, continue to avoid service by presenting to them under a disorganization which they well know does not necessarily produce any very considerable alteration in the natural appearance of the part affected. Thirdly, while the disorder is only in the stage of weakness, the patient always complains of constantly multiplying vision, or of the vision immediately or retrogressively. Fourthly, anisotropia forms appear before the eye, especially as the disorder, even when the patient is entirely blind. Fifthly, the disorder of vision goes on to complete blindness, without any morbid interruption, or retrogression directly, when both the eye is quite blind, and the eye-sight on the other side is perfectly undisturbed, there is one infallible symptom of this anisotropia; namely, if the sound eye be very carefully covered, the pupil of the blind eye immediately expands, and the iris becomes opaque, anisotropia, notwithstanding the diseased eye be exposed to the strongest light possible. However, this criterion is mostly failing, because the anisotropia, qualified with any perceptible effect, except loss of vision, is seldom confined to one eye, but usually affects both. — (*See Lectures des Anstretes*, b. 2, p. 441, 442.)

Mr. Travers divides anisotropic affections into two classes, the organic and the functional. The first comprehends situations, however induced, in the texture or position of the retina, optic nerve, or choroid. The second includes expansion, or loss of function of the retina and optic nerve, depending upon a change, either in the action of the vessels, or in the state of the secretory apparatus.

As marks of organic anisotropia, Mr. Travers enumerates, 1. Lesions, extravasation of blood, inflammatory deposit upon either of its surfaces, and loss of transparency of the retina. 2. Morbid growth within the eyelid, choroid, staphy, and all such obstructions as directly oppose or derange the texture of the retina. 3. Apoplexy, hydrocephalus, aneurysm, or abscesses in the brain, or in or upon the optic nerve, or its sheath, and thickening, expansion, absorption, or distention of the latter. As causes of functional anisotropia, Mr. Travers specifies, 1. Temporary derangement; vascular congestion, or vacuity, in those vessels or cerebral trunks; expansion or distention of extensive membrane, as of the liver, kidneys, uterus, intestines, and lungs; various forms of injury and disease; and sudden transitions of morbid morbid action. 2. Functional derangement, expansion or contraction of muscular power from various constitutional and local causes; from causes common or exclusive of the visual faculty; and from the general or local action of poisons on the nervous system, as lead, mercury, &c.

From the description, says Mr. Travers, it will be understood that organic and many forms of functional anisotropia are incurable; and the functional, by continuation, lapses into the organic class.

Functional anisotropia is subdivided by Mr. Travers into, for the Sympomatic, or that which is only a symptom of some general disease, or disorder of the system; and, for the idiopathic, or that which is the sudden transition of the visual action from another organ of the body; as, for example, from the skin, the testicle, &c. — 340, the Idiopathic, or that which depends upon a peculiar condition of the retina, or, for example, the Sympomatic, anisotropic vision. — (*Synopsis*, p. 122—124.)

On the whole, extreme local atrophy, that is to say, a depression or total loss of the eyeball, associated with any other organic local or constitutional defect, may be said to be a very rare case, the disorder being usually more or less complicated.

To the local complications, *viz.* flux, buphthalmia, cataract, glaucoma; a general various state of the vessel (anæmia, hyperæmia; exophthalmia; atrophy of the eye; encephalitis in the organ and surrounding parts; paralysis of one or more muscles of the eye; epiphthalmia; lepta; pseudos of the eyeball; epiphthalmia or proptosis; and internal epiphthalmia in particular; a vascular buphthalmia of the eye (buphthalmia, buphthalmia); and finally, wounds or contusions of the eye or adjacent parts. With these cases should also be mentioned that important case, *Empyema* of the eye. From this simple enumeration of local processes, those two may be more frequently associated is only a symptomatic effect of another disorder of the eye, with which it is connected, and how often it is connected with the same diseases, namely which germinate another or several other diseases of the eye.

Among the general complications, first, *Intemperance* (those which are purely nervous) impairment of the health in various forms by infection, contagion, or miasmata; a bad habit of body; typhoid fever, the anæmic effects of which upon the eye the author of this work has frequently noticed; malaria; internal and external hydrophthalmia; organic diseases of the abdominal viscera; worms; cholera; consumption; old diseases of the legs; organic disease of the brain and skull; complications arising from pregnancy; leucorrhæa, &c. In these general complications, first remarks that the mutual connection between atrophy and some remote disease of another organ, or of the whole constitution, cannot be mistaken; and in these cases we often see the disease of some other distant part from the eye suddenly or gradually diminished, and immediately appear again as a sympathetic action in the form of amaurosis, of which the most remarkable instance is seen after the sudden healing of old sores of the legs. (Barr, *Lehrbuch Augenkr.* 2. 2. p. 423.)

From the above general remarks upon atrophy it is quite manifest that the symptoms of the disease vary considerably according to the violence of its causes, and of the local and general complications, though the seat of the disease and what is particularly the progressive course of the loss of vision be in the optic nerve; and it strikes especially to the nature of the causes, whether it is that the disease appears to take place in the eye.

It may consider as the only really inoperable symptom of atrophy that weakness of sight (asthenopia), or that complete blindness, in which neither with the increased or unusual eye the loss of sight can be perceived in the structure and shape of the affected organ. Hence, first, the most important of vision or blindness, amaurosis. But how rarely this complete symptom is met with alone, and how frequently it is connected by some other defect in the structure and form of the eye, is proved by many examples.

The accidental symptoms of amaurosis have, however, not been as yet consisting of a considerable distortion of the pupil, and immobility of the iris, because these symptoms are rarely the most frequent; but, as Barr observes, this is another proof that ignorance has prevailed respecting the true nature of that disease of the eye and its modifications, which are usually termed amaurosis.

The accidental symptoms of amaurosis may consist in the faulty size and shape of the pupil. It may cause the pupil to be very much dilated, anæmic, and possess its natural black colour and usual transparency. It cannot be denied that this is the state of amaurosis most, but it is equally true that there are many exceptions. Sometimes, according to Barr, in the most complete and anæmic cases the pupil is of its proper size, and even capable of free motion (Thiersch, *Klinische Periodische*, &c. 1. 2. p. 319; and occasionally, it is actually smaller and more contracted than natural. This latter often sometimes extraordinarily large in the most light. And it is well known that it is unusually small in every kind of atrophy. (Krause, *Reinhold's Handb.* 2. 1. p. 573. Humer, *Augenkr.* &c. 2. 2. p. 414. Barr, *Lehrb.* &c. 2. 2. p. 423.) According to the latter writer, the pupillary edge of the iris partly has its proper shape, being generally more or less angular, either at such considerable point, or

above and below, so as to resemble a worn hammer the edge of the iron part; or towards the lower or upper, so as to have a serrated or toothed in the form of the pupil of a mummified animal. These appearances are highly important, having great influence over the diagnosis.

Frequently not only the size and shape of the pupil are faulty, but the position of that opening is quite abnormal, being inclined either upwards or downwards, or sideways or forwards, but most commonly in a diagonal line between upwards and forwards, and in these cases the pupillary margin of the iris never describes a regular circle, but is always more or less angular. (Barr, *ibid.* 2. 2. p. 423.)

The pupil of an eye affected with amaurosis frequently does not exhibit the clear shining blackness which is seen in a healthy eye. It is found that it is of a dull, glassy, horn-like blackness, which anæmiatization is frequently enough to suggest a well-informed practitioner of the nature of the disease. It is in the words of Mr. Thiersch, "little more than the healthy appearance of the iris in the eye of a horse." (Synopsis, p. 180.) Sometimes the colour of the pupil has an inclination to green; while in other examples this anæmia seems to be dense, white, and cloudy, so that the complaint might easily be mistaken for the beginning of a cataract. The error into which inexperienced surgeons are liable to fall, may generally be avoided by attention to the following circumstances:—The iris appears to be not smaller, and behind the pupil in the place of the crystalline lens, but more deeply in the eye. Nor is it in proportion to the impairment of sight, the patient being quite blind, while the iris appears to be so small, that it is a great pity that the opacity of the crystalline lens, it could at most only receive a slight weakness and obscurity of vision; at the same time, Richter acknowledges that it must be more difficult to avoid mistake when a beginning amaurosis is accompanied with the conditions of atrophy, and consequently when the degree of blindness seems to bear some proportion to the degree of opacities in the pupil. However, in this case he maintains that the true nature of the disease may generally be known by considering the ordinary symptoms of the two diseases. (Anderson, 2. 2. p. 140.) And, according to Barr, when the pupil is of a true dark grey, or greenish-grey colour, a lateral inspection of the eye will show plainly enough that the darkness is in the vitreous humor, and behind it. Sometimes the pupil appears reddish, quite red, or of a yellowish-white colour (Krause von den Augenkr. 2. 2. p. 413; while in other cases the interior of the eye a good way behind the pupil seems quite white, and a concave high-convex surface may be observed, upon which the ramifications of blood-vessels can be clearly seen. In particular instances the vitreous humor behind the whole back part of the eye, while in other cases it only occupies a half or a small portion of it. This peculiar appearance has been described to a loss of transparency in the vitreous itself, and a consequent reflection of the rays of light. (Haller, *Memorie*, Paris, 1763, 5. p. 409. Mr. Thiersch is contrary to the opinion, that it arises from a deficient secretion of the choroid plexus, a pre-matural adhesion between the choroid coat and the retina, and a dislocation or prolapsus appearance of the latter from the same. (Synopsis, p. 181.)

One of the strongest characteristics of amaurosis and an insuperable obstacle, and one most to be depended upon, in practice, is reported by Mr. Thiersch, to be the difference which declares of a visible surface at the true surface. In frequent contact it appears as if a new surface is generally diffused, and most or little about, which increases with the darkness of the light; but in amaurosis a kind of transparency is noticed or emanates from the iris, the flame seeming to be split, when it is examined. (On the Nature, &c. of Amaurosis, Lond. 1811.)

There can now be no doubt that the whitening behind the pupil is sometimes here originated from the diseased state which, in cases of atrophy, the iris of the eye acquires from the deeper part of the organ, and gradually moves its way towards the iris, being always attended with loss of sight. Putting out of present consideration the change of colour within the eye, produced by foreign humors, the above colour changes behind the pupillary coat confirm, as Barr supplies, in very old cases of amaurosis, because the alteration is observed by Schaeffer as taking

plate especially in examples the formation of which was quite sudden. (Vernieuw den Hart, *Scotth.* ii. 3. and Langenbeck has recorded cases in which the same appearance happened in the early stage of the disease.—(New Nat. Hist. p. 46, &c.)

Besides the above appearances of the pupil itself, and of the pupillary margin of the iris, there are also several important phenomena with respect to the action of the iris. Sometimes the iris passes but very slowly, and frequently not in all, though the light be strong, and the upper eyelid be raised over the eyeball. While in other examples a very moderate light will bring on such a rapid contraction of the iris and closure of the pupil, as we never witnessed in a healthy eye.

We have also the authority of Boerhaave for asserting, that in particular instances the eye not only possesses the power of action, but is capable of seeing with uncommon activity, as even in a very moderate light, it will contract to an unusual degree, and nearly close the pupil.—*Amstelred. Ges. Wondur.* b. 3, p. 134, edit. 1785.

Two or three remarkable instances of the latter stage of the iris, in cases of amaurosis, were some years ago shown to me by Dr. Alibert, then staff-surgeon at the York Hospital, Chelsea, and I have seen other similar cases in St. Bartholomew's Hospital. Most of the patients in question had not the least power of distinguishing the difference between total darkness and the visual light of the sun, or a candle placed just before their eyes. Justa sometimes found the pupil capable of motion in this disease, and Schaeffer once noticed the same thing.

Such cases, Mr. Travers thinks, can only be explained by considering the organ to be sound, and the cause of the disease remote or external to it. Thus, says he, in a case of vitreous tumour, compressing the left optic nerve, immediately behind the ganglion opticum, although the vitreous was opaque, the iris was active. In two young ladies, in whom the eyes, as in the former case, were perfect, and the blindness temporary, the iris was even vigorous; and there was the strongest presbyopic evidence from the symptoms that the amaurosis was in the cerebral portion of the optic.—*Opuscul.* p. 128.

In some instances again, when the strength of the light is unusually increased, the pupil expands with more or less slowness.

I have already alluded to the occasional numbness of the iris, notwithstanding the insensible state of the retina. Let me now take notice of a case which sometimes presents itself, and is quite the reverse of this last. The nerves of the iris may be paralytic, while those of sight continue unimpaired. Schaeffer was acquainted with a woman whose pupil was unconsciously dilated, and totally incapable of motion. Her sight was very weak, and sometimes says of no use to her. She could scarcely discern any thing by day or in a strong light, but she could see rather better at night and in dark places. This indistinct sight depended upon the dilated, paralytic state of the pupil, by which too many rays of light were admitted into the eye; and the reason why the patient could see better at night was because the pupil, in its natural state, always becomes contracted in a dark situation.—(See Vermeulen's *Charaktere Schaeffer*, von J. L. Schaeffer, *Med. Z.* p. 12, 13.)

On this curious part of the subject it is remarked by Mr. Travers, that if the retina be inactive, compressed, or unsupported, the iris mechanically dilated, or the optic nerve paralysed, the pupil is inactive, independently of the state of vision. In the first of these cases it is evident vision will be lost; but we occasionally see useful vision combined with the second and third, as they sometimes in which the iris has been half destroyed or has become preternaturally adherent, or is malformative where it is half wanting; and in particular of the vitreous serves accompanying plans.—*Synopsis*, p. 128.

Frequently, in amaurosis, when the sight of only one eye is lost, and the other retains its full power of vision, not the slightest defect can be discovered as long as the patient keeps both of them open; but the instant the second eye is completely covered, the iris becomes perfectly featureless, the pupillary margin assumes an angular shape, and the pupil expands, being sometimes evidently drawn towards the edge of the cornea.—(Boer, *Lectur. von dem Augerkrank.* 4. 2, p. 425. This

demonstrates the difference between the independent and the associated action of the iris.

Besides the above appearance of the pupil and iris, amaurosis is attended with other characteristic phenomena, which occur under certain circumstances, in the form, texture, and state of other parts of the eye and adjoining organs. Thus the patient often complains of a peculiar treacherous dryness of the eye, or of a sensation as if the eyeball were about to be pressed out of its socket; and indeed, says Boer, one may sometimes find a grating noise, and distinguish a fluctuation in the orbit behind the eyeball, when this organ is pressed upon by the finger, or moved in various directions, though neither its movement nor its enlarged, nor any tendency to exophthalmos, be really present. Nor is it very uncommon to find the affected eye preternaturally hard, soft, or even quite flaccid; but it is less common to find the dimensions of the globe of the eye increased, or the organ affected with atrophy.—(Boer, *loc. cit.* p. 425.)

However, in opaque amaurosis, as Mr. Travers notices, a peculiar bluish grey tint of the sclerotic coat is frequently observable; and sometimes even a degree of bulging on one or more sides of the eye, or simply a loss of sphericity, is also appearing flattened.

A consequence of the superficial vessels, especially of the long blood-vessels of conjunctival origin, is likewise another symptom, frequently observed in cases of opaque amaurosis.—See Travers's *Synopsis*, p. 145.

The same gentleman also gives the particulars of a disease, in which a case of amaurosis was attended with a collapse of the retina from absorption of the vitreous humour.—*Op.* *loc. cit.* p. 136.

Some of the peculiar marked effects of amaurosis have been already described in speaking of the several defects of vision, which accompany an inactive weakness of sight. Besides these, however, there are others which merit attention. For instance, the patient feels in the eye and surrounding parts an intense sensation without any visible pain, and complains of a remarkable sense of fulness or weight in the sight. Amaurotic patients are also frequently attacked with sudden violent giddiness, usually ending in a considerable disturbance of the sight, and sometimes in severe general headache. Occasionally they fancy that small objects at first are lodged under the eyelids, and are fearful of moving these parts of the eye. It is also well known, that many persons become insensible while labouring under severe haemorrhage, extending from or to the diseased eye; while, at other occasions, the most violent pains are confined particularly to the region of the eyeball, and have the appearance of being strictly periodical. In certain other cases the pain is wandering, and shoots in every direction about the eyeball. These painful feelings often precede the amaurotic blindness a considerable time, and often first take place when one or both eyes are nearly blind; but the pains and loss of sight are not necessarily produced together. Lastly, some patients are not well, in whom the worst pains only last until the amaurosis is perfectly formed, when they gradually and permanently cease. In all these painful cases of amaurosis, the pain and the blindness chiefly depend upon the same cause, and one is seldom the occasion of the other. Sometimes amaurotic patients experience very violent pains, that they lose their senses and grow delirious; but in these cases, if we can credit the statement of Boer, important mental changes in the basis of the skull, or the brain itself, are invariably noticed after death.—See *Lectur. von dem Augerkrank.* b. 2, p. 429. In some amaurotic patients intense symptoms may be remarked in others, sometimes; and more rarely still again in all its degrees, either as a transient or permanent affection.

According to the observations of Mr. Travers, pain affecting the forehead and temples is a necessary symptom of amaurosis, depending in proportion to the degree of blindness. When the amaurosis is perfect, it usually ceases altogether, if the disease has its seat in the eyeball. But when the pain is severe, remains imperfectly, and is quickly renewed worse by exercise, it is usually connected with organic disease of the brain. In that case derangement and error of the nervous system, look of strength and heat, disposition to anger, occasional confusion of intellect, impatience to exertion, and paralysis of one or more members will be consistent symptoms.—*Synopsis*, &c. p. 167.

Paralytic appearances may precede amaurosis, either in the vicinity of the eye, or in the annulus of the face, or in a distant situation, as the extremities. Sometimes they accompany the disease, and sometimes closely follow the weakness of sight, being not necessarily the forerunners of a fatal attack of apoplexy.

In the acute or convulsive symptoms may be combined with amaurosis, and when they arise occur in the complete stage of the latter disease. Their prognosis (like a very unfavorable one) for the patient's life.

But according to the same experienced oculist, when it is a case of perfect amaurosis several of the external senses are affected; and lastly, when the internal senses begin to suffer, when, for instance, the hearing, and then the smell and taste are lost, and afterward the memory and other intellectual powers fail, the patient's speedy dissolution may be expected.—(See *Lectures on the Diseases of the Eye*, 2, p. 351, Wm., 1857.)

As Professor Ross correctly observes, age cannot be considered a predisposing cause of amaurosis, as it is of cataract; for there are many many blind persons who have been deprived of their sight by amaurosis in their best days than old persons thus attacked. Amaurosis spares no age—not even the new-born infant. Mr. Lawrence, in his *Lectures*, contrasts in this respect, adding his opinion, however, that amaurosis is very frequent during the active middle period of life, and very common about the cessation of menstruation in females, and the corresponding age in the male.

Four forms of congenital organic amaurosis are noticed by Mr. Travers. One in which the eye is preternaturally small, wet, and even closed; the iris translucent, and not influenced by belladonna; and the globe affected with tremor, and not under the control of the will. A second, depending on a deficiency of the pigmentary system; the iris is translucent, strong light produces amaurosis, and vision is limited and confused. The vessels of the choroid give the interior of the eye a coppered tinge. A third case is that in which the sclerotics is encrusted upon the cornea, that the latter is scarcely wider than the pupil. In the fourth kind of congenital amaurosis, described by Mr. Travers, the eyes were in contact, as if attracted by a faint perception of light; but the pupil is fixed, no marks of organic degeneration can be seen; but Mr. Travers apprehends that the disease must be associated with a marked state of the mental or optic nerve.—(See *op. cit.*, p. 153, 351.)

Another does not see, but does appear to have any perception of the objects of the compass; but it would seem that dark eyes, especially those which are called black, are more disposed to amaurotic blindness than such as are light-colored. According to Ross's expectation, the eyes may in this eye affected with amaurosis, have an iris of a dark-brown, or dirty brown or black even here, diseased. In the peculiar constitution of the eye, then, as well as in a strabismus and choroid transposition, there exists a tendency to the disorder.

More frequently than cataract, amaurosis is found to be a hereditary disease.—This is so much the case, that most of the members of a family for many that one generation may lose their sight from blindness at a certain period of life. There are that he is acquainted with more than one family in which this has happened, and what merits attention, the women of one of these families, down to the third generation, became completely and permanently blind from amaurosis on the cessation of the menses, while all the others who had had children were unaffected. But the father of this unfortunate family, who as well as the females have very dark brown eyes, all seem to be weak-sighted, though none of them are yet blind.—(Lectures on the Diseases of the Eye, 2, p. 442.)

In women, especially those with black eyes, the time when the menses stop is a dangerous period for the commencement of amaurosis.

According to the same writer, patients whose vision went to blind gradually for a long time, but who were suddenly stopped, and whose eyes are dark, are very liable to amaurosis.

One of the less common causes of amaurosis is an aneurysm, or aneurysm in this or that part of the retina, or in the optic nerve, or in the part that carries the optic nerve. This is to be followed by the gradual weakness of sight, or the pain, headache, which comes on at the very commencement of pregnancy, and sometimes after

delivery, but always attended with dyspnoea and other probable vomiting. This species of amaurosis, however, should be carefully distinguished from that which sometimes occurs in the last stages of pregnancy, and chiefly from among the long-sustained interstition of blood in the head and eyes, particularly when the bowels are at the same time loosed, and the patient comatose. This latter case usually continues till after delivery; or if the uterus is relaxed, difficult, and attended with considerable efforts, the symptoms may then attain its complete form at the time of delivery, and not afterward.

There was a young woman, who, at the very beginning of her first labor, progressed, which followed each other quickly, regularly lost her sight, becoming completely insensible between the third and fourth months, but in the first two months she continued blind till after delivery, but in the third instance the power of vision never returned at all. Her vision had under her care another system, who was attacked with amaurosis whenever she drank chocolate; but upon leaving off that drink, she never afterward had any complaint in her eyes.

If we are to believe the generality of writers on this subject, the abuse of better stimulants, as of chocolate or coffee, better and better, and better medicines, especially quinine, is undoubtedly a predisposing cause of amaurosis.

The abuse of mercuric preparations sometimes may in direct amaurosis; amaurosis does of course, by the way; belladonna, &c. Last will do the same thing. Respecting the operation of some of these causes, however, Mr. Lawrence entertains a doubt. The mercuric preparations tend to dilate the pupil, he observes, are supposed to give a tendency to amaurosis. He has never seen such an effect produced by the belladonna; and he adverts to one case in which it was used a great length of time. The effect of writers seems to him equally problematic.

One not unimportant and very important cause of amaurosis is hysteria and hypochondria, with which must be mentioned infatuation, and disease of one or more of the abdominal viscera, especially the liver.—(See *op. cit.*, p. 351—446.)

According to Richter, the causes of amaurosis may be properly divided into three principal classes, the diagnosis of which indicates three general methods of treatment.

The first class of causes depends upon an extraordinary plethora and turbidity of the blood vessels of the brain, or of those of the optic nerve and retina, upon which last parts a degree of pressure is thereby supposed to be sustained. A considerable plethora, especially when the patient feels himself, or feels his head very heavy, and frequently notices the appearance of black specks before the eyes, and sometimes complete blindness. A plethoric person (says Richter) who held his breath, and looked at a white wall, was conscious of observing a kind of net-work which immediately appeared and disappeared with the dilation and contraction of the arteries.

Richter thinks it likely that the disease in three patients, when it proceeds from the stagnation of blood in the vessels of the brain, not being blind according to custom, the suppuration of the menses, and the cessation of menstruation from place. In the same manner the complaint may be brought on by great bodily exertions, which must determine a more rapid current of blood to the head. Richter refers to a case of a man who became blind all at a sudden, while engaged in a heavy burden up stairs. He tells us of another man, who labored excessively hard for three days in a workshop, and became blind at the end of the third day. Pregnant women in like manner are sometimes bereft of their sight during the time of labor. Richter has received a remarkable instance of this in a young young woman, thirty years old, and of a full habit. When she was pregnant, she was troubled with violent sickness all the time of delivery, so that nothing would stop in her stomach. She was blind three or four times without effect. Towards the ninth month her sight grew weak, and her sight on the day before parturition, she was quite blind. The pupil of the eye was greatly enlarged, but retained its orange black appearance. She recovered her sight immediately after delivery, and did not suffer any particular complaint. Richter remarks on this that he has been three times a

witness of this extraordinary circumstance.—Verworn's *Chir. Schenkel*, 1861, p. 6, 1864, 1866.—Richer speaks of a person who lost his sight during a violent fit of vomiting. Schenkel argues that it is not uncommon for soldiers, who are performing forced marches in hot weather, to lose their sight all on a sudden.

Now this coincides with Schenkel, Richer, and others, in regarding as a frequent cause of amaurosis repeated and long-continued depletions of blood to the head and eyes, produced by various circumstances, viz. by pregnancy; a tedious and difficult labor; lying and carrying heavy loads, especially with the arms raised up; all kinds of work, in which the eyesight and ocular faculties are intensely exerted, with the head bent forward, and the abdomen compressed, as is the case with shoemakers, tailors, &c.; every sudden stoppage of natural or unnatural long-continued passages of blood, so that of the venous, arterial, or hemorrhoidal; the cessation of habit and sometimes of more particular action of the ear; severe and obstinate vomiting; febrile action in hot dry weather; sunstroke and other swellings of considerable size in the neck, pressing upon the jugular veins, and obstructing the return of blood from the head; the use of a pedicure, or wax bath, the water of which is of high temperature; hard drinking; violent gusts of passion; dropped and excessive over-dieting; and hard smothering at food. These causes are most likely to occasion amaurosis in proportion as the individual is young and phlegmatic. The causes of this amaurosis, which is characterized in its first stage by increased sensibility of the eye, and expiration of life, are noticed by Professor Moir in strabismus which produce a long and repeated determination of blood to the head and eyes.—*Reich, Lehrb. von den Augen*, b. 2, p. 495 and 500, &c.

Mr. Lawrence, in his *Lectures on the eye*, remarks, in its most frequent and important form, that which is seated in the eye itself, is precisely the most difficult to treat, on account of the structure; including under this those of degrees of increased vascular action, whether dependent on filaria, syphilis, arteritis, &c., or on inflammation in its internal and most, and the most common cause of inflammatory diseases, that is, serous change permanently destroying the structure of the part. When, says Mr. Lawrence, we advert to the structure of the retina, we again suppose that it would be labor in vain to effect; we find it composed of minute ramifications of the retina covering the eye, and in that network of vessels the nervous pulp is deposited. The state of the retina, when situated after death, in amaretic eyes, reveals manifest disease; it exhibits those changes which are continued, independently of disease, until death, it has been found discolored, opaque, watery, half-colored, tough, and in some cases even melted. The preceding doctrine is, however, judiciously qualified by its restriction to the disease situated in the eye itself. The retina and optic nerve, Mr. Lawrence affirms, with other surgeons, may be diseased sympathetically, so the stomach may be diseased without any change visible in the retina.

The second class of amaurosis supposed to operate by mediating either the whole body or the eye alone, and may include the general or local use of toxic materials. In the first case, the weakness appears as a symptom of considerable general debility of the whole system; in the second case it is altogether local. Every great general weakness of body, let it proceed from any cause whatsoever, may be followed by a loss of sight. Amaurosis, if we can give credit to the opinions of Richer, is sometimes the consequence of a tedious diarrhea, a violent violent fever, profuse hemorrhage, and hemorrhoidal discharges.—Also Verworn's *Synopsis*, p. 144. Richer refers to a debilitated woman, who became blind on the sixth hour after delivery. According to the same author, we find weakening causes operate upon the eyes, and occasion blindness, as powerfully and often as premature and excessive indulgence in venereal pleasures. Mr. Lawrence, in his *Lectures*, does not coincide at some of the foregoing views. "I think," says he, "who have regarded amaurosis as arising from debility, have overlooked the facility and ease of the cure, may be produced by all those circumstances which debilitate the system generally,

such as loss of blood from profuse hemorrhage, diarrhoea, copious discharges, &c. I have never seen amaurosis produced by such causes. That general debility and grief may throw the sensibility of amaurosis, I am inclined to allow; for it is not improbable that across expressions of that kind may produce inflammatory excitement in the brain or eyes; but I think we cannot without good direct proofs, ascribe the influence of debilitating causes generally to the production of amaurosis. The most clear instance of any directly debilitating cause producing amaurosis, is that of protracted suckling."

The causes which operate locally in weakening the eyes are various. Nothing has a greater tendency to debilitate these organs, than keeping them long and attentively fixed upon minute objects. But however long and sensibly objects are viewed, if they are diversified, the eyes suffer much less; than when they are all of the same kind. A frequent change in the objects which are looked at has a material effect in strengthening and refreshing the eye. The sight is particularly injured by looking at objects with only one eye at a time, as is done with telescopes and magnifying glasses; for when one eye remains shut, the pupil of that which is open always becomes dilated beyond its natural diameter, and lets an extraordinary quantity of light into the eye. The eye is generally very much hurt, by being employed at the close inspection of brilliant, little-colored, shining objects. Among the occupations recommended by Mr. Verworn as particularly exposing persons to amaurosis, are those of needle-workers, writers, draughtsmen, inspectors of linen and woven cloths, and of new banknotes; money counters, watchmen in iron-furnaces and glass-furnaces; tavern-cooks, watchmakers, engravers, philosophical instrument makers, and others, &c.—*Synopsis*, p. 144.—They are greatly mistaken, says Richer, who think that they save their eyes, when they illuminate the object which they wish to see, the evening with moon light, or with a lamp that intercepts and collects all the rays of light, and reflects them upon the body which is to be looked at. Richer mentions a man, who, at the middle of winter, went a journey on horseback, through a snowy country, where the sun was shining upon bright snow, and was attacked with amaurosis. The speaker of another person, who lost his sight in consequence of the chamber in which he lay being suddenly illuminated by a vivid flash of lightning. A man was once seized with blindness, while his eyes were fixed on the moon, in a fit of great emotion. Richer also mentions the belief, that a concussion of the head from external violence, may sometimes operate directly on the retina, so as to break and render them completely paralytic.

Richer observes the following statement; but, he says, among the most important causes is to be considered every abuse of the eye itself, especially its dissipated position, as a long and close inspection of one object, particularly with a microscope, when the thing examined is very brilliant or reflects back much light into the eye. Hence the use of pencils of light, and long gazing through camera obscura &c., are conducive to the disease. In this respect, every kind of ray or heat which strikes the eye itself, and reaches the retina, is to be considered as a cause of amaurosis.—See also Verworn's *Synopsis*, p. 144. Thus, recommending lamps, like Argand's, the view of a white wall illuminated with lantern's rays; and holding a long white stick at the eyes, or pasting especially the sun, with the unassisted eyes, are circumstances likely to bring on the disease. That a flash of lightning, especially when it suddenly strikes a person at the sight out of a post-hole, may produce an amaurotic condition of an irritable eye or even perfect blindness, is a well-known fact, and it is on the same principle that going suddenly out of a dark house, immediately after waking in the morning, into an apartment that contains an open candle, or person, is liable to hurt the eyes, though the time elapsing may only be very short. There is also to be included every kind of over-excitation of the eye by light, as happens to blind patients, when they lie with their eyes open all the day in a large sunny chamber.

Very often the cause of amaurosis proceeds in local or constitutional debility, proceeding from impairment of the nervous power, or of the power of the blood, especially those of the cerebral and systemic; either

Does a constriction of the visual nerve, arise from a considerable length with the weight of the whole body upon the head; constriction of the eyeball, sometimes caused by violent sneezing, but more generally by constriction of the eye with warm vapours, &c. Some of the cases of amaurosis seen below in the temple of the eye, observed by Mr. Travers, were associated with signs of disorganization; some were superficially inflamed; and others presented no external appearance of injury. We learn also from the same authority, that it is not always the eye on the struck side of the head that is affected.—*Opuscula*, &c. p. 152. If we are to believe Beer, and other foreign practitioners, considerable direct weakness may arise from cholera, jaundice and diarrhoea, starvation, and the violent spasm of influenza and hoarse; bleedings; impetuous kicking of the children; excessive indulgence in luxury, and the over-employment of intellect. A general debility, which has the most effect on the eyes, may also arise from long trouble, especially when the diet is poor and food; also from a deficiency of proper food; long watching; violent and violent fight; impetuous reading the eyes with very cold water, especially when they are already weak and irritable; and keeping them long in a dark place, particularly when they are thus situated a good deal in some picturesque mode of labour, a case which, Beer says, is very frequent in Venice. The amaurosis following typhus, whether any unusual irritation of the eye by light. Beer also notes the general debility.—*Lectures von den Augen*, &c. 2, p. 466, &c.

Like nervous febrile cases Mr. Travers, amaurosis sometimes follows typhus and vesicular fever, and the various forms of acute constitutional disease. He has several times met with it as a consequence of influenza fevers. He observes that it is also sometimes a consequence of chronic wasting diseases, which organic changes interrupt the nutrition of the system. He has seen a rapid and severe atrophy sustained for a chronic affection, and when disease had previously affected the eyes, *hemeralia* in both.—*Opuscula*, p. 153.

With regard to the doctrine that certain forms of amaurosis are diseases of debility, Mr. Lawrence expresses his dissent in its corporeity, and asserts, that the only scientific and successful treatment of amaurotic affections is found to be stimulative. Whether the atrophy resulting from typhoid fevers, of which I have seen several instances, proceed from debility, or from too great a determination of blood to the head, may admit of dispute; but I conceive, that in many of such cases, toxic treatment is clearly indicated, if not for the eye itself, certainly for the generally enfeebled state of the health, which the amaurosis is connected. Yet Mr. Lawrence's doctrine, that debility and weakness of the vessels originally lead to the amaurotic affection, may be more correct than the theory which refers the blindness simply to weakness. However, as the amaurosis generally does not show itself till an advanced stage of disease, or that of great debility, and as it only ceases as the patient regains strength, it can hardly be considered as a case in which any other treatment than rest is to be avoided. It is right to state that Mr. Lawrence himself, notwithstanding his belief in amaurosis being a kind of inflammation of the retina, modified the antiphlogistic treatment according to the state of the constitution.

The third class of eyes consists of strabismus, most of which are asserted to be in the oblique muscles, whence they correspondingly operate upon the eyes. The government of Haller, Boisson, and Schramm; all tend to support this doctrine. Many aphakic subjects are found to have suffered with tremor and laceration, or even atrophy by repeated squintings, trappings, and other means, which have manifested themselves in the same manner and the defective functions in general. Haller tells us of a man who lost his sight, a few hours after being in a violent passion, and recovered it again the next day, upon taking an emetic by which a considerable quantity of bile was evacuated. A woman is also cited, who became blind whenever she was troubled with what are termed verticils in the stomach.—(*See Analses des Wundarben*, b. 3, cap. 14.) However, according to Beer, impetuous amaurosis seldom depends upon disorder of the gastric organs, excepting the rare few cases. (*Lectures von den Augen*, b. 2, p. 456.) a very important difference from the sentiments entertained by Schramm, Richter, and

Boerhaave. The close sympathy between the stomach and the eyes is well illustrated by a case recorded in some of the journals, and referred to by Mr. Lawrence in his Lectures. It was an amaurotic man, fixed pain over the epigastrium, it is said. It was not tolerably passing and other digestive functions: an eructus was at the given; and under its action a loud was rejected from the stomach, and the amaurosis immediately disappeared.

Amaurosis sometimes proceeds from mechanical irritation. A wound shot almost the upper eyelid, and lodged at the upper part of the right orbit, between the eyelid and eyeball, so that it could be felt externally. The patient shortly afterwards became blind in the left eye; but recovered his sight after the removal of the shot.—*Analses des Wundarben*, b. 3, p. 424.

According to Beer, several constitutional disorders, but more especially gonorrhea, are deeply concerned in the production of amaurosis. Whether these Beer's theory of what he terms gastric amaurosis, will naturally doubt the existence of the theory; and Mr. Lawrence himself asserts, in his Lectures, that he has never seen such a case, or that it is not necessary to refer to the effects of the nervous structure of the eye. It is not because amaurosis sometimes occurs in gonorrhea or rheumatic affections, that the affection of the sight is necessarily of a gonorrhea or rheumatic origin; for the fact itself proves, that such constitutions are not exempt from the risk of being attacked by disorders of the eye. Mr. Lawrence has also observed, any case, in which the signs of amaurosis could be referred to any other cause.

Regarding the causes of amaurosis, the following remarks by Beer claim attention. Various swellings to the eye, as, for instance, enlarged tumours, oedema, hydrophthalma, the death of the optic nerve, may and must gradually produce complete amaurosis by their pressure upon the optic nerve and retina. Some of these cases are usually characterized by a protrusion of the eye from the socket.—(*See Encephalitis*.) In Mr. Lawrence's system is a question of two anastomotic eyes, in which the optic nerves are struck at about one-third of their natural size. Similar instances are recorded by Dr. Mead.—(*See Wundarben*.) According to Mr. Lawrence, Mr. Lawrence has also seen interesting specimens of enlargement of the third ventricle, the pressure of which he says is in some upon the optic nerves, and thus to account for the amaurosis under which the patients laboured.

In the same manner different morbid changes in the brain itself, and in the bases of the cranium in particular, may be the direct cause of amaurosis; for example, hydrocephalus internus, cancer, and aneurysm at the base of the skull.

Just as aneurysms is frequently a very symptomatic effect of various disordered states of the constitution, so may different morbid changes, commenced in the eye by these states of the health, become the immediate cause of amaurosis. As hydrophthalma, encephalitis, cancer, leucorrhoea, dislocation of the vitreous humor, &c.—

From a contagious atmosphere, which is generally injurious to the eyes, an amaurotic blindness may originate, though but very rarely, and as it would pass, only through the powerful influence of such cause, of the air over the whole singularity and nervous system. Destituted, nervous, weakened persons, by remaining long in the atmosphere of a party (Cham, Médec. de Paris, 1771, lib. 2, art. 5, and Boisson, De Morbis Animi, p. 12), that of a damp cellar, or exposed to other effluvia, may be suddenly attacked with amaurosis; and Beer asserts, on that his experience confirms the truth of these reports.—(*Lectures*, &c. b. 2, p. 424.) A sympathetic affection of the nerves of the eye, with a various picture in the upper part of the eye, is one of the most frequent causes of amaurotic blindness.

Atropine, not yet fully considered, and very like the antispasmodic, consists of an homogeneously dissolving secretion of the pigmentary system from the retina hydrophthalma, rheumatism, and eyes, which secretion, in some individuals earlier, and more considerably, in others later and in a slighter degree, coincides with other symptoms of a different nature.—(*See Boerhaave's Lectures von den Augen*, b. 2, p. 151, &c.)

As Mr. Travers has correctly explained, the history and concomitant appearance of amaurosis, usually

But the adoption of some original method of treatment; but, declares Beer, no to the patient whose surgeon, under these circumstances, derives from a heap of what are considered remedies for anæmia, as from a lottery, the first as the best?

In order to avoid this erroneous method, and not render a half-blind person completely blind, instead of improving, or at least preserving, whatever amount of vision there may be, the surgeon should act with great caution, and constantly bear in his mind, first, the symptoms, sex, and age of the patient; secondly, his ordinary employment, and general mode of living; and, thirdly, the principal morbid appearances under which the anæmia originated and was developed.—(Beer, *Lectures on the Diseases of the Eye*, 2, p. 306.) But what will be the prudent anæsthetic as a correct acquaintance with the anæmia, the anæmia in general, and the contraindications under which the use of this or that particular remedy is likely to be useful or detrimental. I know of no writer who has been so minute on this part of the subject as Beer, whose conclusions (as it also remains, see here in every respect different from those of Bland and Scarpa) for, like the anæsthetic of this pedagogue, he rarely employs the electric plan of treatment, which, according to his principles, is not only inefficient, but harmful, whenever the blindness is attended with determination of blood to the head and eyes, perhaps, an accidental reflexion, or, what is understood by a phlegmatic diathesis. Beer's opinions, respecting the employment of caustic and other means for the cure of anæmia, may be partly collected from the sequel of this article. But more especially from the fuller statement which will be made at a future opportunity.—(See *Glossa Bergei*.) In the mean time, I shall endeavour to offer a general account of the anæmia recommended by Bland, Beer, Richter, Scarpa, Travers, and Lawrence, according to the arrangement of causes adopted by the second of these valuable writers; for I need not repeat, that, wherever the method of cure can be directed against the causes of the disease, it is the most proper and available. The present article will, then, close with some practical observations, chiefly taken from Professor Beer.

In that species of anæmia, which arises from the first class of causes, or those which induce the disease, by means of a preternatural retrograde stagnation of the blood-vessels of the brain or eye, the indication is to lessen the quantity of blood, and the determination of it to the head. For this purpose, the patient may be bled in the arm, temporal artery, or, as is often preferred by foreign surgeons, in the foot. This evacuation is to be repeated as often as seems necessary, and it will be better to begin with taking away from twelve to sixteen ounces. The efficacy of bleeding, in the cure of particular cases of gutta serena, is strongly exemplified by numerous well-authenticated observations. Richter informs us of a woman, who, on leaving off having children, lost her sight; but recovered again by being only once bled in the foot. A spontaneous hemorrhage from the nose and eyelid a young woman, who had been blind for several weeks.—(Amberg, *de Wundt*, l. 3, p. 412.)

That bleeding is sometimes harmful and wrongly practised in anæmic cases, is a fact which admits of no doubt. Mr. Travers particularly refers to one description of cases where the latter does harm; those from cause of active determination of blood to the organ, which is especially common after deep-seated visceral inflammation or disease from over-excitement, by which its vessels have lost their tone; an effort definitely increased by depletion. An interesting case of this kind, is related in the perfect recovery followed a regulated diet, and a course of the blue-pill, with saline aperients.—(Syncope, p. 163.) All cases of direct debility and prope paralysis of the retina (says Mr. Travers) are aggravated by loss of blood, and the great prevailing mistake in the treatment of anæmia, is the indiscriminate diminution of blood.—(Syncope, p. 263.)

When, in addition to general bleeding, relief is also necessary, further may be applied to the temples, or cupping-glasses to the back of the neck, or leeches. Besides bleeding, purgatives, blisters, touching the foot with warm water, see also, above, of the uterus, &c. are frequently proper.

To such cases, the foregoing means that is proceeding

the desired benefit, even when followed up as far as the pulse and strength will allow. Here the restoration of the disease may depend either upon the stoppage of some wasted excretion of blood, or else upon some other cause of the first class. In the first of these cases (says Richter), experience proves, that the disease will sometimes not give way before the normal discharge is re-established. A woman, who, on the anterior aspect of the eye, had lost her sight in consequence of a sudden expression of the mamma, did not recover till nearly six months after the return of the menstrual discharge, notwithstanding the trial of every sort of evacuation. He also tells us of another woman, who had been blind half a year, and did not improve, and in whose interior parts of generation leeches were without effect applied. As often as the leeches were put on (says Richter), the menses in part flowed; and so long as they made this appearance, which was seldom above ten hours, the woman always enjoyed a degree of vision.—(Amberg, *de Wundt*, l. 3, p. 455.)

For the anæmia arising from expression of the mamma, Scarpa recommends leeches to the peduncle, bathing the foot in warm water, and afterward exhibiting an emetic, and saline pills, made of starch and tartaric acid, combined with glyster and moderate anæsthetics. If these means fail in establishing the menstrual discharge, he says, great assistance may be placed in a system of electricity, conducted from the lower sacral plexus, in every direction, and thence especially to the thighs and feet. He expresses no doubt of the want of success at first, as the plan frequently succeeds after a trial of several weeks.

For the anæmia proceeding from the stoppage of an habitual gæstric bleeding from piles, Scarpa recommends leeches and decoctions to the hæmorrhoidal veins, third an emetic, and afterward the same opening pills.—(Observationes in principis Malattie deq. Orchi, cap. 19.)

When the disease does not originate from the stoppage of any natural or habitual discharge of blood, and does not yield to the evacuating plan, Richter thinks the surgeon justified in concluding, that the systemically altered vessels have not regained their proper tone and diameter, and that repeated corroborant remedies, particularly cold water, ought to be employed. In this kind of case, he is an advocate for washing and bathing the whole head with cold water, especially the part about the eyes; a method, he says, which may often be practised after evacuations, with singular and remarkable efficacy.

When the return of sight cannot be brought about in this manner, Richter advises us to try such means as were calculated to stimulate the nerves, and preserve the torpid addition of the optic nerves in particular. Of these last remedies, says he, caustics are the principal and most effectual.

The principle on which Mr. Lawrence directs the treatment, is that of giving a stop to vascular excitement, with the view of preventing the permanent injury of almost strumous, and impaired functions of the retina. Hence he is a warm advocate for the antiphlogistic treatment, in the early stage of anæmia. "But," says he, "if this treatment be not found to remove the change which has been produced in the retina, we must have recourse to surgery, which appears to be as decidedly beneficial in those cases as it is in, or general neural inflammation. The remark which I made respecting the use of surgery in those affections, applies also to the present case; namely, that its good effect usually depends upon the preternatural with which it is employed. The alternative is inefficient; we give it with the view of increasing inflammation in the structure, which is the very seat of disease; that structure is easily changed by the inflammatory process; our only remedy is to push the matter in a decided manner, and if we do so, we shall put a stop to the affection." When the antiphlogistic treatment, and a fair trial of surgery have failed, Mr. Lawrence directs himself with recommending such management as is most conducive to general health; as a residence and frequent exercise in a pure air; plain nutritious diet; mild aperients, with the occasional use of an active purgative; and repose of the affected organ. He mentions also a trial of a tonic, or repeated blisters behind the ears, or at the side of the

ble, which causes modify in the appearance of the body being considerably lacinated, or fissured at the eye, or without larger in particular magenta. The case requires, in particular, general and copious evacuations of blood, and the application of cold vesicles to the eyelids and forehead. An emetic should next be given, and followed a purge of potassa tartaric, or small repeated doses of antiscorbutic tartaric acid. By means of Vesicating and caustic, Scurviness often removed the symptom of soldiers who had lost it in striking forced marches, with very little butting. The Scurviness, usually accompanied by severe anger, in chronic is the more strongly enhanced after bleeding, as the bloodness, their anger, is always attended with a bitter taste in the mouth, tension of the hypochondria, and constant nausea. Most of patients a Scurviness, who become completely blind after being in a violent passion, and which enough has remained the very next day, by means of an emetic, given with the view of inducing severe stress marks of blood disorder in the stomach.

Marjolin's treatment of the improved amaurosis brought on by fever, deep sorrow, great loss of blood, intense study, and those symptoms of the eye on very intense of brilliant objects, consists also in removing all irritation from the stomach, and afterward strengthening the stomach system in general, and the nerves of the eye in particular. In the case arising from fever, the emetic and opening pills are to be given; then bark and opium, and bitters; while the report of the liver amaurosis is to be applied to the eye itself.

When the disorder has been brought on by grief or rage, the stomach and uterus are to be cleared by means of antiscorbutic tartaric acid, and the opening pills; and the choice is to be completed by giving bark and opium; applying the vapour of lighter aromatics to the eyes—aromatics containing, easily digestible food; diverting the patient's mind, and bring it on agreeable scenes, and recommending moderate exercise. The amaurosis from grief is said to require a longer perseverance in such treatment, than the case from sorrow.—(Scurviness Diseases, cap. 12.)

In this country, the emetic practice, which has proved so decidedly efficacious in the continent, has not been attended with much success; Mr. Travers even states, that he does not recollect an instance of decided benefit from it, though he has often tried it fully. He agrees, however, in the indication, as he remarks, that the removal of an irritating or oppressive cause, will often effect a sudden and marked cure, as by clearing the intestinal canal of retained secretions, restoring the digestive functions, or taking away blood where the necessity is indicated. In gastric cases for which emetics have been particularly recommended, he prescribes a long-continued course of the tonic pill, with gentle saline purgatives, and tonic bitters.—(Scurviness, p. 226—228.)

There is also a high authority against the use of emetics, even in the amaurosis from disorder of the gastric organs. When, says he, the subjects have a tendency to be discharged upwards, as indicated by constipated masses and vomiting to vomit, mucus, which never operates without some violence, and is to be most carefully avoided in puerperal individuals, or those who have a violent determination of blood to their heads and eyes, or any compression of the circulation. The caustic here given must be observed, even though sometimes may be often avoided seem advisable; and, according to him, the determination of blood and the state of the system here mentioned, are commonly attendant upon this species of amaurosis. Indeed, notwithstanding the testimony of Welserstein, Richter, and Keemp, in favour of emetics in this case, their position seems, that the violent operation of an emetic frequently converts the sympathetic amaurotic weakness of sight all on a sudden into blindness. Although I myself have seen many have been completely prejudiced against emetics, another obliges me to add, that in this country, their efficacy in the present disease is by no means equal to the representations of Richter and Keemp. When there is less tendency to vomiting, but the case is attended with an oppressive sense of weight about the stomach, frequent eructations, as if arising from rotting eggs, an indurated belly, and loose hypochondria, a gentle aperient course may be tried, especially when the illness have been for some days continued, in which circumstances I have found, that

whenever brisk purgatives are always of the greatest service, when in regard to the general constitution, and the anatomic weakness of sight; the removal of the offensive matter from the alimentary canal being immediately followed by a cessation of the determination of blood generally mentioned. Lastly, when this syndrome originates altogether from the presence of worms in the bowels, common antihelminthics are to be resorted to. In all these cases, says I have, there local treatment is quite inapplicable and very doctored.—(Ibid. Letter vol. 4th August, b. 2. p. 247—251.)

The third species of puerperal amaurosis, is that which arises from retinal inflammation, is of two kinds; in one, the disease is the consequence of a general weakness of the body; in the other, it is the effect of debility, which is confined to the eye itself, and does not extend to the whole constitution.

According to Scurviness, the incomplete amaurosis from general system similarity, requires freshening, general-salt medicines, and long-continued exercise, especially by candle-light; is less a case of total amaurosis, than 2 weeks or eight days a fringed state of the retina, especially of those consisting of the immediate cause of sight. When this complaint is recent, in showing subject, it may be cured or diminished, by stopping the vitreous canal with small repeated doses of stramonium, and then giving tonic cordial remedies. At the same time, the patient must abstain from everything that has a tendency to weaken the nervous system, and, consequently, the eye itself. After stopping the vitreous canal, it is proper to prescribe the decoction of bark with valerian, or the infusion of quinine with the addition of a few drops of sulphuric ether to each dose, with nourishing easily-digestible food. The aromatic spirituous vapours, mentioned in the article Ophthalmia, may then be locally applied; or, if these prove inefficient, the vapour of hyacinth ammonia. The patient must take exercise on foot, horseback, or in a carriage, in a wholesome dry air, in warm weather, and avoid all excess of sun-bathing. He must avoid all thoughts of cure, and remain free from any eyesight-stimulating objects. The impression of vivid light on the retina is always to be moderated by means of the green glasses.—Scurviness, cap. 22.

One case of temporary palsy of the retina from acute catarrhs, mentioned by Mr. Travers, yielded to blennorrhoea, the method, and a gentle salivation excited by calomel joined with opium.—(Scurviness, p. 164.) Another case, brought on by the use of telescope and exercise, gave way to a copious bleeding, brisk purgative with julep and calomel, answers to the torpors, and a course of history.—(Ibid. cap. p. 166.)

Mr. Travers remarks, that the amaurosis from depletion is sometimes mistaken for the opposite case, viz. that from Reticular congestion: this is owing to the continuance of a dilated and insensate pupil, vision, and a deep-seated pain in the head, with occasional vertigo; and its frequent occurrence in a corpulent habit. By a cautious use of venesection says Mr. Travers, it is relieved; by whatever leucorrhoea or stagnation, whether that of menses, it is decidedly aggravated. In this form of amaurosis, vision is further enfeebled by the loss of as much blood as flows from two or three leech bites.—(Scurviness, Act. p. 166.)

When the weakness is confined to the eye, Richter thinks corroborated appropriate more necessary. Bathing the eye with cold water, says he, is one of the most powerful means of strengthening the eye. The patient should lie in cold water a compress, doubled into eight folds, and sufficiently large to cover the whole face and forehead, and this he should keep applied, as long as it is comfortable. Or else he should frequently apply cold water to his eyes and face with his hand, on a piece of rag.

The eye may also be strengthened by repeatedly applying blisters of a sulphuric alkali above the eye, leaving just long enough to excite vesicles. Richter likewise speaks favourably of rubbing the upper eyelid, several times a day, with a mixture of the tincture of hyacinth ammonia and spiritus myrtilli.—Antiquary der Wundarzt, b. 2. p. 452.

When no probable cause whatsoever can be assigned for the disease, the surgeon is justified in employing such remedies, as have been proved by experience to be sometimes capable of relieving the affection, although upon what principle is utterly unknown.—(See Gouta Serena.) To this article I would refer the reader

before he makes up his mind about any extended period of treatment, because he will have had many cathartics and emetics given by him, respecting the remedies for amauirosis in general. To his remarks, I have also inserted some others, on the same topic, as appeared to me interesting.

Causes common to

This species of the disorder, of which I have met with but two days, nearly unknown to complete blindness; it occurs chiefly in very old persons, and it is perhaps the affection in which some writers have given the misleading name of "atrophic amauirosis." Sometimes, however, this kind of amauirosis takes place in young persons and children; and one circumstance that so rarely presents itself in the preceding is, that it always takes place rather in thin, emaciated, old, gray-headed subjects, usually in the case of hereditary scurvy, in whom consequently the weakness of organs rather is carried on to senility, or else in young subjects, who are scurvyish, and disposed to consumption, hectic affections, emaciated children, and so in a catalogue of various injuries of the eye. While this amauirosis is not perfectly formed, the iris retains its maturity, and the pupil is neither preternaturally dilated nor contracted; but when once the patient is quite bereft of vision, the muscles of the eye are slow, and the pupil larger than in a healthy eye in an equal degree of light. At the bottom of the eye, very far behind the pupil, a excessive pale-gray, lardaceous-yellowish, or variegated reddish opacity is developed. By this the sight is not really weakened, but rendered quite confused, since all objects, but especially smallish ones, appear to be confounded together, particularly when the patient tries to inspect closely any determinate body. The duration of the disease advances, eye brighter and more visible in the bottom of the eye, the pupil is the color of the iris; a strong very conspicuous, dark-eyed person; and when once the amauirosis is complete, so that no susceptibility of the increment of light is left, then, upon an attentive examination of the eye, one can not merely perceive, in the troubled deeper part of the eye, a very slender vascular streak, which merely consists of the ordinary ramifications of the central artery and vein, which are more visible at the pale-colored bottom of the eye. In a half-darkened place, such an eye presents a shining yellowish or reddish appearance, but only in certain positions of the eyeball, such, in this respect, is somewhat similar to the eye of a cat, wherein I have chosen to term the complex of all these transitions. The disorder is also accompanied with any other essential morbid appearance, except the dilation of vision or complete blindness.—*Lieber von dem August 1. 2, p. 506.* Beer, in *Fig. 1, tab. 4* of his second vol., has given three rather agreeable representations of this very remarkable species of amauirosis. The difference in the appearance at the bottom of the eye, in this case, from those presented in the early stage of fluxus lachrymosus of that organ, will be best understood by referring to the article Fluxus Lachrymosus. On this point, however, I may here briefly state, that in the cat-eye amauirosis there is no projection, but, on the contrary, a notable depression in the axis of vision. Cat-eye amauirosis may be known from twilight amauirosis, by the opacity being more deeply seated, and having a shining, partly crystalline.—*See Journ. of Foreign Med. Vet. 3, p. 125.*

Beer observed that the process of this species of amauirosis is so slow, that whenever it afflicts upon the subject can be removed with impunity. After what has been said in the foregoing paragraph is considered, about the particular individuals who are likely to be afflicted, and the change of the eye to a pale color, as a common symptom of this case, a suspicion may be entertained that a deficiency of the parietal nutrition, and of the tension of the iris, in consequence of the stoppage of the secretion, may be the cause of the disease. Beer justly remarks that much might be learned, on this point from the dissection of eyes thus affected; but he has never met with the opportunity.

The prognosis cannot but be very unfavorable; for, as the amauirosis is general of course, he almost never will receive credit to be adopted for their removal. It is fortunate, however, that this amauirosis rarely attains the highest degree, but always remains in the form of a more or less considerable misty opacity.

Just as little is yet known respecting any well-regu-

lated mode of treatment; for the disease may sometimes be kept quiet, putting more by the careful employment of such general measures, regimens, and diet, as are calculated to improve the health. However, in the most frequently managed cases, few ever know a step made towards the removal of the disease.—(*Lieber von dem August 1. 2, p. 487, 498.*)

Amauirosis produced by fluxus, certain periods of lead in particular constitutions, or the poison of lead.

The reality of the first alleged cause is sometimes doubted in this country. The following treatment is recommended by them. In the first stage he advises gentle mercurial cathartics. When profuse menses, a few ounces of blood may be taken away by venesection or leeches applied behind the ears; when after bleeding a determination of substance towards the eye still continues in full action, or there is any tendency to inflammation. The same topical bleeding without venesection, but with leeches put on, containing such or mild, is proper when no general plethora exists; and merely a determination of blood to the head and eye and some suppuration of the circulation prevail. Frequently, leeches put on to the supra-orbital vein has excellent effects; and externally, positions composed of head-ouch and vinegar, or fomentations containing opium, are the means which Beer has found most successful in the first stage of this form of amauirosis.

As in the first stage, a moderate antiphlogistic general or local treatment is the only one which can be adopted, and which in urgent cases may yet avert the patient from blindness, so in the second stage no internal and external employment of lead stimulants is of great service; for example, mercury combined with opium inwardly, lotions to the eyeballs, and the exposure of ether to the eye. The amauirosis produced altogether by the poison of lead, and complicated with headache and illness, will require, in addition to the foregoing means, such remedies as are known to be of service in these latter disorders.—*Beer, Lieber von dem August 1. 2, p. 498—502.*

Systematic amauirosis in individuals affected with Acute, Apoplectic, epileptic, and convulsive.

This amauirosis is nearly permanent, and usually succeeds as soon as the apoplectic, epileptic, or convulsive attack is over. However, the complaint may begin at two periods, viz. either during such an attack, or (what is more uncommon) afterward, and it never loses its symptomatic character. The pupil always remains perfectly clear, and of a shining blackness, even when the disease has attained entire blindness; but a slight dull pain in the forehead, especially about the eyebrows, constantly pressing and accompanying the blindness, generally lasts a great while after the amauirosis has completely subsided.

Besides the foregoing general symptoms, the following characteristic appearances present themselves in apoplectic and apoplectic patients, who suffer frequent attacks of violent spasms. The pupil is much dilated, and the iris, which is translucent, seems evidently to project in a convexity forwards, when the eye is inspected sideways; consequently, the anterior chamber is flattened. The eye itself does not seem freely in the socket, the patient experiencing an itching, and sometimes a truly painful sensation, as if the eyeball were loosely connected (Ophthalmodynia). Every attempt which the patient himself makes to move the eye, or the surgeon to push it out of the position which it has assumed, is ineffectual and extremely painful. The eyelids are either partially shut, or incapable of being shut at all; the sight is very weak, but seldom quite extinguished; and at the termination of each attack vision returns, though every patient knows it more and more debilitated, until at length the spasmodic attacks of blindness frequently occurring, and lasting a long while, it is entirely lost. But when the disease has acquired its utmost degree, the eye always will retain the power of discerning the light, and a sudden lapsus that vision is attended by the first or second attack. It is different with respect to the symptomatic phenomena of this amauirosis, in hysterical or hypochondriacal patients, especially when they are afflicted with spasms, before, during, or after which the impairment of sight originates; for though the pupil may continue quite clear, it cannot escape the notice of an attentive observer, that, together with a

med of diminished diameter, there exists a peculiar method of the iris, a constant flattening of it between expansion and contraction, technically called *hypoplasia pupillæ*. This convulsive state of the iris is usually accompanied with a similar affection of the eyelids, namely, with an involuntary blinking, sometimes, and not infrequently with an involuntary pendulous falling of the eyelid (ptosis). In these patients the amaurosis, being of sight hardly ever present, appears to complete blindness, but, taken correctly to mean as a weakness of vision, characterized during the rest of life by numerous fluctuations of the eyeball, directed to light, and frequent sensations as if there were shining very objects before the eyes.

This case of sympathetic amaurosis is characterized by an untroubled, but very expanded pupil; considerable dilatation of the margin of the iris; a dilated state of the pupil, even under the stimulus of the strongest light, and tremulous motion of the eyeball, which continues during life, after the epilepsy and amaurosis are cured; and the case is further characterized by myopia, which rarely increases to complete blindness.

According to Beer, the amaurosis connected with convulsions is most frequent in children. The first and most constant symptoms of this incomplete or complete amaurosis consists in an extremely violent convulsive motion of the eyeball, especially upwards, not infrequently attended with the most violent convulsive motions of the eyelids. The pupil is excessively dilated, and scarcely the least movement of the iris is distinguishable on exposing the eye to the strongest light. When the general twitchings subside, and only an spasmodic weakness of sight is left, strabismus occurs in both eyes in various directions, though the eyes very seldom deviate from the axis of vision in the direction towards the inner canthus. When the general convulsions happen frequently, and are violent and of long duration, the amaurotic weakness of sight usually changes into perfect blindness, in which the pupil, though it be regularly dilated, and of a shining brightness, is greatly expanded, and the eyes constantly retain their fixed position and position also motion.

With respect to the prognosis, it is observed by Beer, that even when merely an amaurotic weakness remains, the prognosis is always serious, but it is naturally still more unfavorable, when the blindness is complete, and when the loss of sight has suddenly resulted after violent spasmodic, epileptic, or convulsive attacks, without such attacks themselves ever returning. Under these circumstances, Beer has not hitherto seen more than two instances of such blindness partially cured. Especially some lapses of recovery may be experienced, when the amaurosis, or even complete amaurosis, begins with these attacks, but always terminates with them, without leaving any serious impairment of vision. On the contrary, it is a very bad sign, and only in regard to the removal of the hyperplastic amaurosis, but likewise in the cure of the organic disease, when the amaurosis gradually precedes these attacks, and lasts a considerable time after their cessation. As yet, Beer says, he has not known any such patients cured, either of their spasms, epilepsy, or convulsions, much less of their blindness; on the contrary, after three or four attacks, perhaps numerous seizures, and some of the patients die in one of these paroxysms.

As this amaurosis is merely a symptomatic effect of the above general diseases, its removal must entirely depend upon the success with which their treatment is conducted. Were the hyperplastic process, however, after the cure of the organic disease, the vision could be restored after time by an artificial mode of treatment, and ascertain what good could be effected with strabismic and tonic medication. — Beer, *Kleinewassersdorfs Archiv*, 1, 2, p. 308—410.

Radiating amaurosis.

According to Beer, radiating amaurosis is not very uncommon, and is as plainly marked by certain symptoms, that it scarce will be mistaken; namely, a perfectly white pupil, various in the fixed state without contraction and dilatation, the iris seeming to be nearly transparent; the eyes when from the slightest causes, and especially being moved or less inclined to light; the case is invariably attended with wandering, irritating pains, sometimes affecting the eyelid itself, sometimes the vicinity of the eye, and in other instances, the teeth or neck. After these two eyes are affected to-

gether, which is not regularly the case, a crust of the eye, which cannot be called actual matting, may be removed, and frequently the surface of the crystal is chiefly obstructed only in one direction, though sometimes a true strabismus of the eyes exists (Beer). In nearly every instance there is considerable weakness of the lower parts of the upper eyelid, and not unfrequently, a complete *blepharoptosis*, but total blindness is seldom produced.

According to Beer, this amaurosis, which is to be considered an organic affection, often arises from keeping the head long exposed to the air and is chiefly met with in individuals who, while suffering profusely from the scalp and hair in warm weather, have taken off their hats, and remained with their heads a long while uncovered. As, however, in warm weather the proximity of persons exposed themselves to sun-bath, and few are attended by persons, I infer that sweating may be requisite for the production of the disease.

Under certain circumstances the prognosis is by no means unfavorable, and Beer has succeeded in effecting a perfect cure, when the amaurosis was not completely fixed, and not of very long standing, the patient had no tendency to gout, and when during the treatment every thing likely to bring on an attack of that disease was avoided.

The treatment consists not simply of local matter, which indeed are always needed, but likewise of general measures. With regard to the latter, Beer assumes that valuable experience has observed less of the prognosis which ought to be given to the extent of radiation joined with matting, and given alternately with the compound powder of quercus bark; which powder, as soon as the wandering pains about the eye and eyebrows begin to be milder, and more fixed to the part, are to be succeeded by the extract of nuxtina, antiscorbutic preparations, and fumes of sulphur. Externally, the most powerful opening ointment are not to be omitted, especially flinties applied successively behind the ears, to the temples, and externally; and as soon as the pain has completely subsided in these last parts, and as perhaps more concentrated in the eye, flinties are to be made on the eyelids with balsam, containing at first a stibiac quantity of aqua, and afterward of the sulphuric acid. At length, when the pain is and about the eye is greatly subdued, but some degree of amaurotic weakness of sight is left, flinties with nuxtina and a small proportion of tartaric lime and tartaric acid will be found exceedingly beneficial. Afterward, when a considerable time has elapsed without the restoration of the slightest sensitive part in the eye, its opacity, or the loss, but the amount is not probably established by perseverance in the above general and local treatment, and especially when the patient is formed of the larger of one or more of the upper eyelids continue as when happens, galvanism may be tried, with the current elsewhere provided. — (See Kleinewassersdorfs Archiv.) And in the most desperate cases, Beer advises of making an incision in the depression between the angle of the jaw and the maxillary process, and keeping it open for a fortnight, after the recovery almost complete. — (Lieberkühns Archiv, 1, 2, p. 340—350.)

Tranquil amaurosis.

Beer applies the epithet "tranquil" to such cases of amaurosis as are the consequence of a considerable wound of the eye (such as wounding parts, or the globe). Here, consequently, is first changed the strabismus produced by the irritation and contraction of the lachrymal and the frontal nerves, from a constant into the tremulous. Secondly, Beer reduces the considerable swelling from external violence directed in such a degree against the upper or lower side of the globe, that the retina is torn and many of the essential vessels portions of the eye forced out of their natural situations. Thirdly, Beer includes every weakness of sight or perfect blindness, which is the result of such injuries of the eyeball, though not attended to the cause, as the effect, viz., to lacerate lacerate eyes and to pierce it. For the prognosis and treatment of all these cases, he refers to his observations upon strabismus. Not does he choose here to treat of the perfectly congenital amaurosis, which is a direct consequence of a deep-seated, because it never happens unperceived by a violent general inflammation of the eyeball, and therefore is to be regarded as an effect both of the injury and the action.

man together; but which, like the sympathetic anisocoria, following common and passive external spasm, may be easily known by the total insensibility to light, and the evident changes in the contour and shape of the eye; and is quite as treatable as the other anisocoria in which we have alluded to.—(Lect. von den Augen, 1. 2, p. 541.)

Grey amaurosis.

According to Mr. Travers, good attacks of the eye through the medium of the stomach. Vomiting occurs with pain in that organ, on the subsidence of an inflammation in the circulation, and is succeeded by violent pain in the head. The loss of sight is sudden, is sudden and permanent.—(Synopsis, &c., p. 182.) The grey amaurosis described by him, is, perhaps, badly named; at all events, there are some circumstances in its history which must cross the idea of the subject. Grey amaurosis, he says, has two forms. The first is characterized by a very considerable distention and angular displacement of the pupillary edge of the cornea towards the centre; a constantly increasing slowness in the movement of the iris, and final insensibility of this organ; an actual change of colour in both the circles; a dull, glossy blackness of the pupil, and a certain taint in the latter of the serum; an alternate appearance of the grey and black cloudy substance described in the account of the general symptoms of amaurosis, which effect lasts while the patient is not totally blind. This disorder is further indicated by a floating, wandering, itching, yet not very severe pain, all about the vicinity of the eye; a manifest tendency to a various enlargement of the blood-vessels of the conjunctiva and sclerotic; a transient metamorphosis of sight after meals, or any condensed nourishment; or, sometimes, a considerable temporary decrease of heat of the species of air which breathes the patient; the transitory cure remission of the disease, for which several years are usually required; and finally, by the nature of the patient's constitution. For, in general, this amaurosis if he is a scrofulous man, always attacks both eyes at once, and is confined to elderly and very imbecile, slender, weak, delicate figures, who either have suffered from scrofula in their childhood, or from hereditary or chronic diseases at a later period of their lives; who are not yet far advanced in years; and whose tissues have never been very life-giving though profuse.

It is remarked by Beer, that although the second form of grey amaurosis makes no attack upon males as well as females, the latter, on the whole, are more frequently affected, particularly about the period when the system cures. This amaurosis, which is seldom fatal quickly, but is, at all events, in months, but mostly requires years for its production, begins with cloudy, indistinct vision; an appearance of filigree colours before the eyes; and a peculiar squinting, as if persons were travelling over the sky shaded eye. The pupil becomes incessantly dilated, and presents a rich greenish-gray colour, which, however, is easily distinguished from the colour seen behind the pupil in the anisocoric eye, and gradually deposits upon some fibres in the vitreous humor (phlegma). Also the iris, the pupillary edge of which is drawn towards both angles of the eye, so in the first form of the disease, transforms an obvious change of colour, first at its best circle, which becomes of an exceedingly dark line, and then in its greater parts. The alteration of colour from redness of certainly proceeds from a general varicose state of the blood-vessels of the eye, which affection daily augments, and is attended with increased pain in the organ and surrounding parts; it even in the whole head, or one side of it, whether the blindness attack one or both eyes together. This violent pain, however, which is such as often to distract the patient, is transient and irregular, being immediately aggravated by every violent mental emotion, whether of the exulting or depressing kind, every sudden and considerable change of temperature, every quick accession of any cold weather, or when the patient stays only for a short time over a very heated fireplace, from hot bath, or even with flannel, or he has been eating any indigestible food. These attacks of pain subside without any medical assistance, at the dry, warm season of the year, and in a mood, but too late, climate are often kept off for several years. Upon every

such attack the glaucous becomes more evident, the pupil larger and more angular, and the eyelids perceptibly weaker. At length, during one of these painful exacerbations, vision is completely abolished, and the least sensibility to light remaining; and the pupillary edge of the iris, together with the base, circle of the same organ, then entirely disappears, being inverted towards the iris. The circumference also gets so much swollen, that the cornea acquires a watery, grayish color, and in length the black substance of the iris may be perceived at various points, particularly about the place where the fibres of the arteries are affixed. Afterward the pupil, or what may be more properly called the glaucous circle, is gradually developed, and the eye then gradually returns under the most violent attacks of pain. The light which the patient always thinks he sees, but which, according to him, is produced of a reddish or brown color in the interior of the eye, like grayish, keeps up the hope of recovery; but as insensibility of this luminous appearance ceases as soon as the eye begins to mend. The first degree of grey amaurosis readily changes to the second, especially in persons who are getting into years, or are over the period of life when inflammation subsides.

According to Beer, the apothecary's magnifying glass is no medicine which is adequate to the cure of the first form of this amaurosis. A good change of the whole constitution, would be requisite, are success could be expected, and such change it is not in the power of physic to accomplish. In one single example Beer succeeded in checking the disease, by persuading the patient to observe a strict regimen, and a grain of medicine being given; but the patient still remains weak-sighted, though various medicines have lately been tried.

With respect to the treatment of the second form of grey amaurosis, Beer observes that it should be like that of grey tritis. In particular, attention must be paid to the effects of pain, and patients must be advised. The patient should be upon further beds, and especially feather pillows, but only employ articles of this kind which are stuffed with horse-hair. Neither must he expose himself to an atmosphere which is at the same time both cold and damp; and if he cannot altogether take care of himself in this respect, or if events let him keep his head and feet warm and dry; when everything which tends to impede the functions of the skin; and avoid pork meat, every thing cooked with sage, lard, and oil and salt dishes, like hennings. With what are usually considered as good medicines, the practitioners should act very circumspectly; and, as in grey tritis, he should pay close attention to the state of the constitution, rather seeking to afford relief by means of a well-regulated diet, than by the employment of much physic.

Of the amaurosis occasioned by the sudden rarefaction of the vitreous humor, and of all others of this kind.

When the amaurosis assumes its ordinary form, Beer has not yet been able to decide if it is any particular characteristic symptoms by which it can be effectually distinguished from the second form of grey amaurosis, excepting, first, that it originates and increases very suddenly, while the true anisocoric amaurosis is a long time, and the first pain several years, is forming. Secondly, that at its commencement it is never attended with violent pain in the eyes or head. Hence, the diagnosis will depend very materially upon a correct recognition of circumstances. But, according to Beer, there are some cases in which, besides the complete blindness, unattended with the slightest power of perceiving light, there is no characteristic symptoms, but extraordinary enlargement of the pupil, total insensibility of the iris, and an insensate projection of the iris.

Regarding the cause of this amaurosis, Beer says that he has nothing important to offer. He owns that, after the sudden rarefaction of the vitreous humor, and of all kinds of the lens, an amaurotic blindness does not always ensue; and he believes that the reason why this does not ensue in other organs, sometimes the brain, the lungs, or the testis, &c., may probably depend upon the fact that organs depending to be most predisposed to disease. There the disorganizing matter will not require so long to take hold of them that such a mode of accounting for things is entirely hypothetical.

and destitute of proof. It is indeed so correct in a series of explanations that it admits of being extended to all diseases without exception. It seems to be reasonable, the progress is very important, and in many cases highly instructive; that, because an organic part, namely the optic nerve, is directly affected, which, by the operation of external and internal causes, is even rendered unfit for the performance of its function. Secondly, because in the majority of examples important changes immediately take place in the organization of the whole eye, which are particularly difficult of removal when the nervous system is affected. Thirdly, because it is impossible to know whether morbid changes may not usually arise in the retina as a consequence of the optic nerve.

In the treatment, Beer, who places great reliance upon the above statement of causes, is an advocate for suppressing as quickly as possible the original disease; and if that cannot be done, he thinks some artificial disease should be formed in lieu of it. For these purposes, he often employs blisters and friction with mercurial ointment. The treatment, where mercurials happen to follow the cure of itch, seems very objectionable, as it consists in inoculating the part with virus, which is quite infected, as if it were not more favorable to remove than that like perpetually associated with the other disease; the professor's theory being transformed by the circumstances under which the patient whose sight is restored by this exposure could ever venture to have a sore skin again without the risk of a fresh attack upon his eye. But it seems, from Beer's account, that the patient's suffering himself by the mercurial can always cure his eye; for, says he, when this method fails, there is still rational treatment should be tried.

When amaurosis follows the healing of old sores, Beer recommends the formation of fresh sores, by applying to the cornea various caustic compounds, and the use of soda; and if the new vessels cannot be made to discharge properly, he proposes the application of issues to the sides of the face, and, in urgent cases, to the thighs. These plans are to be aided by such medicines as are especially good for the skin, the artemisia, especially the sulphur artemisia effluvia. Beer also speaks favorably of sulphur baths; and in cases complicated with debility, aromatic wines, particularly the odorous aromatics and bark.—(See Lehrbuch des Augenheils, b. 2, p. 526—533.)

Of the sympathetic anisocoria in being in nature, from suppression of the secretion of milk.

This case is set down by Beer as one of the most interesting varieties of anisocoria. It comes on rapidly after sudden stoppage of the secretion and excretion of the milk, with violent inflammation, concentrated about the forehead and eyebrows; troublesome lacrimation appears; an insupportable distention of the pupil; and scarcely any perceptible irregularity in the pupillary edge of the iris, which is quite motionless, somewhat shagreened in color, and veined. The disease is also accompanied with great aversion to light; a palpable tumescence of all the blood-vessels of the conjunctiva; a slight turbidity of the transparent media of the eye; and, at last, with a more weakness of sight, which, in the end, suddenly changes into complete anisocoria. The breast, when before the attack once full of milk, are now empty, and hang down like bags, but are quite free from pain.

From the few cases which Beer had seen, he inferred, that the progress is always unfavorable when the mammae are engorged, and particularly when there is a marked distended change in the transparent parts of the eye; for, in the latter case, he has known patients remain perfectly blind, though the secretion of milk had been most successfully and expeditiously re-established. In one instance, the remedy applied to the breast, instead of re-establishing the secretion of milk, excited in the part a painful inflammation and abscess, dying: While the weakness of sight subsided, though it was very considerable.

In considering these analogous cases of anisocoria, enough has already been said, concerning the first and most important indication, namely, the re-establishment of the action which is obstructed, and here the only question is, about the manner in which that object can be most expeditiously and safely effected. For, says Beer, it should be constantly remembered, that the pro-

vision of a complete anisocoria blindness essentially depends, not only upon the removal of the secretion from the breasts, but upon this change being made without delay. The remedies which Beer has found most effectual for this purpose are warm poultices applied to the breasts, and at first composed of simple emollients, and afterward of more stimulating ingredients, such as linseed, chamomile flowers, &c. When the breasts have more of a leucophlegmatic appearance, then that indication of a fulness of the mammae passed, and disposition to a removal of the milk secretion, Beer anoints them plentifully with aromatic unguent, and applies them alternately with well-washed linen, full of dry aromatic plants, and sprinkled with camphor. These last unguents are very useful, at night, or when the patient is asleep, and from warm poultices cannot be put so effectually often. In the daytime, the breasts should be frequently and gently rubbed with warm liniments, medicated with oil of rose and yucca. This plan is to be followed up until the secretion and excretion of milk are restored, and the anisocoria subsides. When the secretion either cannot be restored by the foregoing means, or the sight does not return with the re-established secretion, internal remedies must be tried, especially arsenic, joined with calomel and camphor. Issues or sinuses should also be formed, and kept open for a considerable time.—(Lehrb. von dem Augenh. b. 2, p. 532—533.)

Of the sympathetically anisocoria from morbid changes, either in the optic nerve and other channels, or in the brain of the patient, or the brain itself.

Beer says, a very considerable number of cases of this form of anisocoria, which have often lasted long years, have existed than, as it were, yet only to know it at once, but so obscure the exact symptoms.—1st. Its duration is constantly very slow, and it is all cases the patient is not very completely deprived of vision, but, for more or less time, previously to its death, rendered quite incapable of distinguishing light. 2dly. A violent peculiar symptom of this anisocoria consists in marked changes in the structure of the eye, which are at first almost perceptible, and increase very slowly. 3dly. The anisocoria either originates during an attack of violent headache, which continues almost uninterruptedly until death, or the headache does not come on until complete blindness has taken place; or the patient may have no pain whatever either in his eye or head. 4thly. In the progress of this anisocoria, objects invariably seem to the patient to be perceived, distorted, &c.

Symptoms when the disease proceeds from disease of the optic nerves or their sheaths.

This case comes on slowly, and rarely attacks both eyes together. It always commences with a black cloud, which grows more and more dense, and with a headache, increasing prostration and disfigurement of every eye, without the least painful sensation in the eye or head. The patient usually complains of a slight sensation of dull pressure in the bottom of the orbit, as if the eyeball were about to be forced from its socket, or slight displacement, however, there is not the usual anisocoria. In the very beginning of the disease, the pupil is slightly considerably dilated, and the pupillary vessels of the iris become very prominent on several points, the pupil sometimes representing an irregular position or hexagon. By degrees, though very slowly, a pronounced change of the various lacinated vessels, and afterward of the lens itself; the only species of glaucoma, which Beer has ever seen quite inviolated with a various affection of the blood-vessels of the eye. At last, the globe of the eye becomes perceptibly smaller than natural; but a complete atrophy does not ensue.

Symptoms when the case proceeds from disease of the skull or brain.

In this form of anisocoria, which usually attacks both eyes together, or at least one very soon after the other, the blindness then commences very slowly, with appearances as if every object looked at were perceived or distorted. However, there is no black cloud, but rather an obscurity or confusion of every object. The disease in this stage is slow accompanied with frequent sickness, ugly nervous spectra, and, for the most part,

with aversion to light, unconsciously early closure of the iris, a contracted pupil, angles in the upper and lower portions of the pupillary margin of the iris; no evident transgression of the blood-vessels of the eye, gradually augmenting with more violent localities this actual atrophy of the iris; frequent convulsive spasms of the eyes and eyelids, and strabismus of one or both eyes, making a great deviation of one or both of these organs from its normal position. Under these symptoms, vision is altogether entirely abolished, and the headache, though subject to remissions, grows so violent, extending back to the spine, that the patient is often nearly frantic, and, indeed, after a time, a destruction of the cerebral sensorium happens, followed by that of the medullary function. The first of the sensorial sensorium strikes as last is always the hearing, which ordinary is mind follows by loss of the smell, or taste, or both these senses together; and then the memory and other intellectual powers decline. In this stage of the disease, the eyeball too unfortunately protrudes from the orbit, a pathological symptom, to which their attention given importance, because it is an infallible criterion of a diseased state of the tissue of the orbit, of the parts which invest this cavity, and of the optic nerve and their roots, in the same manner. In such cases, complete blindness usually follows, and this sometimes in its most violent form, when the patient happens to be first carried off by paralytic symptoms; life, under these circumstances, never lasting any considerable time.

As far as our external senses can discover, the cause of both these forms of amaurosis, as the title of this section specifies, lies in certain morbid-changes in the structure of the optic nerve and its investments, or in diseased affections of the houses of the contents, the dark matter, and the brain. But how these changes arise, is not so easy of explanation. The several changes in the structures above mentioned, which have been described, accompanied by atrophy, caused in a real isolation of the optic nerve, and an isolation of them as their sheaths, while within the skull these are colored, gray, very much diminished curves presented to view of medullary structure even as far as their origin from the brain. On the contrary, the white substance presented externally its natural appearance. The retina seemed to have lost its pigmy matter, was bright, not easily torn, and appeared to contain but of a vascular appearance. In one example, although both eyes had been completely deprived of sight together, there found only the retina and optic nerve of the left side in this state of atrophy as far beyond as the point of union in the optic nerve. On the other hand, the same nerve of the right eye was hard, without being in the least divided, and was closely adherent to its external coverings. Apparently to their destruction, looking at all anatomical in order there could be discerned, that a very sharp, strong scraped was required for its removal, though in color and shape it was perfectly natural. On this side, also, the pia mater choroid was entirely wanting. In three associated patients of this kind, there found hyaline between the coverings of the optic nerve, and where such hyaline lay, the medullary matter seemed to have been displaced by their pressure. With the utmost care, he could not trace the degenerative changes.

Now also found in the optic nerve a large hyaline, which had produced atrophy.—(Obs. Anat. Harv. Obs. 2.) In Mr. Munk's case, there is a projection of the optic nerve of an anastomotic eye, where a tumor of considerable bulk has arisen from the base of the brain.—See Woodbury's Essay on the Medullary Anatomy of the Human Eye, vol. 2, p. 127. In that work are several examples of various other morbid changes of the optic nerve, especially calcareous concretions within it, the presence of a bony matrix, gray fluid in the diseased material, instead of gray, a swelling of the nerve, &c.

To the present description of cases, they refer the instance recorded by Rudol. Ophth. Period. Obs. 10, p. 173, in which a calcareous tumor was found between the lamellae of Hyack and the vitreous humor. According to him, there is preserved in the specimen and anatomical processes of the general hospital at Vienna, an eye, diseased with a smaller calcareous mass, without the exposure of the lens being at all affected. Examples, in which the atrophic changes

arise from atrophy in the brain, are reported by Hallerius (Observations Hist. 7, by Pylagius (Med. Aug. 2, p. 110, by Goussier (Mémoires de l'Acad. Turin. Obs. 1, p. 212, Schenckius (Eph. Nat. 1, p. 11), and Mr. Turner (Synopsis, p. 143). The latter author has recorded an instance in which a firm lamellar tumor, of the kind of a garden hose, situated on the same side as the blindness, comprehended the optic globe and nerve at its origin from it.—(Synopsis, p. 151.) I have seen a case of atrophy, in which a tumor as large as a building-sized apple was found in the external lobe of the brain, divided with pressure of the eye, and vast destruction of the brain. Mr. Turner has been mistaken by a medullary tumor of the brain. A case, occasioned by division of the lamellae, is related by Villeneuve (Journ. de Médecine, 1811, Fév. p. 19); another, of a tumor of the lamellae on the same side as the blindness, is recorded by Feil (Med. Constat. vol. 1, No. 4), and other instances in various parts of the brain are described in Ephes. Nat. Cur. Dec. 2, Ann. 6, and in Obs. 253; De Harv. Ratio Medendi, T. 4, p. 151; Ann. des Sciences, 1807; Munk's Winkler, 2, No. 13; Taber, Obs. 1, p. 108; Thomson, Anatom. p. 100, by 100, &c. On this part of the subject, I beg leave to refer also particularly to my friend Mr. Woodbury's valuable Essay on the Medullary Anatomy of the Human Eye, vol. 2, p. 174, &c.

The several alterations of the house of the cavity of the skull mostly happen at its basis, and not only may cause take pain, but still more frequently evidence of various forms, which are sometimes so small that they are first detected by the bone giving the feel of a rough granule. At the same time they are so slight, that if the finger be passed rapidly over them, it will be scarcely felt. In these cases the house of the cavity of the skull undergoes several extremely thin; the diploe is almost entirely wanting, and the portions of the orbit are preternaturally augmented, and in some places ruptured. One specimen of a lady's skull who had been completely blind, and for some weeks previously to her death insensible, in which instance scarcely any part of the cavity of the skull could be usefully reached without risk of scratching the fingers with spines. Once in an anastomotic boy, who for a short time before his death was so insane that he used to devour his own excrements, there found at the side of the sella turcica a long considerable spine, which passed directly through the optic nerves at the place of their decussation. A case of atrophy produced by a spasm of bone is given, the opposite side of the brain is related by Anderson.—See Trans. of the Society of Edinb. vol. 2. Sometimes the atrophic bone has been found carious (Baltimore, Philadelphia, No. 7); sometimes other parts of the cranium.—(Munk's Winkler, 2, No. 6; Schenckius, Vermischte Schrift, 2, p. 12.) Nor is it uncommon to find the medullary substance of the brain hard as soft as pig, while the external substance is full of blood-vessels, and unusually firm, the decussation being hardly distinguishable.

Many of the causes of amaurosis are of such a nature as to render the disease totally incurable. Of this description is hyperæsthesia, in which the structure of the retina and optic nerve is changed in a remarkable manner, the whole cavity of the eyeball becoming filled with a substance resembling medullary matter, and the optic nerve changed in its form, color, and structure.—See Woodbury's Essay on the Medullary Anatomy of the Human Eye, vol. 2, p. 130; See Lond. 1815.

On the authority of Kirker, one case is given, record, where the sense of sensation depended upon an atrophy of the central cavity of the brain.—(Phil. Neurographia, vol. 2, p. 122.)

In another instance the vitreous humor, which is naturally a yellow gel, near the center of the retina, was found black.—Munk de in Specul. Med. d'Observation, 1818.

Binocular, it has Schenckius (Anatomia, 18, 1, sec. 18, describes various cases which were quite incurable; after both the blindfold in one instance was found to be accompanied by an encysted hyaline, weighing fourteen drachms, situated in the substance of the vitreous, and pressing on the optic nerves near their origin. In the second, the hardness was produced by a cyst containing water and lodged on the optic nerves

Where they arise. In the third, it arose from a variety of the *op. thalam.* and a *conspicuous* aberration in the form of the optic *thalamus*. In a fourth, the cause of the disease was a malformation of the optic *thalamus* themselves. In some of the instances in which an aberrant aberration was discovered in the optic *thalamus*, the Mr. Ware conjectured that a dilatation of the inferior portion of the *cornea* anteriorly may be the cause of the affection. The *circulus arteriosus* is an arterial circle, surrounding the optic *thalamus*, formed by the carotid arteries on each side, branches passing from them to meet each other before, and other branches passing backwards to meet branches from the basilar artery behind. The anterior part of this *circulus arteriosus* lies directly over, and is in contact with, the optic *thalamus*, and just in the same way as the anterior branches of the optic *thalamus*, the posterior may lie over the *truncus cerebri* below. Hence Mr. Ware attempted to infer the aneurysm itself, and the paralytic affection of the eyelids and muscles of the eye, sometimes attendant on the complaint, to a dilatation of the anterior and posterior branches of the *circulus arteriosus*. The frequently distorted state of the trunk or small branches of the *cornea*, anterior to the side of the optic *thalamus* is noticed by Dr. Baillie in his useful work on *Morbid Anomies*, and he says, the same sort of dilated structure is also found in the basillary artery and its branches.— See Ware's *Chir. Obs.* on the Eye.

In 1920, M. Magendie related to the French Academy of Sciences various facts emphasizing the remarkable influence of the fifth nerve on all the senses, and with respect to the sense of sight, he finds that the action of the eyeball and optic nerve cease immediately they are completely deprived of the influence of these nerves. Thus a state of the eye is produced that has the grossest analogy to myopia. Indeed, when the fifth nerve is divided in an animal, it is instantly bereft of sight on the side on which the nerve has been cut, notwithstanding the eye retains in the normal all the physical conditions necessary for vision. It is not to be supposed, however, that the fifth nerve performs the function usually referred to the optic nerve. To perceive the light, and to see, as Magendie remarks, are, approximately speaking, two different things. An animal whose fifth nerve has been divided does not see, neither is it conscious of the brightness of the strongest artificial light; yet it demonstrably perceives the impression of the rays of the sun when they fall directly on the eye. Hence a heating, warm condition of the optic nerve on the one part, and of the fifth nerve on the other, is essential to perfect vision; and M. Magendie therefore deems it highly probable that there are two kinds of myopia, one depending on a particular alteration of the optic nerve and retina, the other an disease of the fifth nerve, and also defect of its influence on the organ of vision. These deductions led him to make trial of a combination of acupuncture and galvanization for the cure of certain cases of myopia. There is one case, having considered one needle into the ophthalmic nerve, and another into the optic maxillary, he brought the needles into repeated contact with the two poles of a Voltaic pile. In a fortnight the patient had received considerable benefit from the pain. Other cases are also recorded in favour of this treatment.—See *Journal of the Royal Society of Medicine*, 1904, p. 126 of 1904.

[illegible]

by James Ware. Inquiry into the causes preventing success in the cultivation of the Chestnut, &c. by the same. Overlaid with Malabar cloth, 4th ed. A. J. Spon, Paris, 1844. This book has gone through many editions in Italy. The last, which is much improved, has been well translated by Mr. Briggs. W. H. p. in *Practical Observations on Surgery, and Med. Diet. and Inquiry*, vol. 5. Schewcher's *Wundärztliche Vorlesungen*, &c. p. 272. *Meister's Jahrbuch für die Naturgeschichte*, &c. p. 5. *View on the Diseases of the Eye*, by Wilson, New York, vol. 2, 1850. Some critical remarks on the posthumous work on the Diseases of the Eye of the late J. C. Sammler, by Dr. Arnold, *Mémoires de l'Académie de Médecine de Paris*, 1844. J. Stearns, *On the Structure, &c. of the different Species of Anomura*, Nov. 1821. 6. *Treatise on the Squamous of the Dura of the Eye*, by David Lewis, 1834. *On Sarcosis's Junctions on Dissection of the Eye*, the reproduction of which in a separate form, with references to the first works and authorities, would make up if the most useful books on the subject.

Many additional observations, connected with the subject of animals, will be found in the articles Cataract, Diplopia, Fungus Haemorrhoides, Graft Serum, Hematocopia, Hemidysia, Nyctipopia, Sign. Deform of, &c.

AMBE. *Artemia* *Artemia*, the projecting edge of a rock, an old charrminal machine for relieving dislocations of the shoulder, and so called because its extremity projects like the prominence of a rock. Its invention is ascribed to Hippocrates. The trace in the most ancient mechanical contrivance for the above purpose; but it is not at present employed. Indeed, it is scarcely to be met with in the richest cabinets of surgical apparatus. It is composed of a piece of wood, rising vertically from a pedestal. With the vertical piece is articulated, after the manner of a hinge, a horizontal piece, with a gutter formed in it, in which the located limb is laid and secured with straps. The patient places himself on one side of the machine. His arm is extended in the gutter and secured; the angle formed by the union of the ascending piece and by the horizontal branch is lodged in the strap, and then the horizontal branch is depressed. It is now extended to the side, while the vertical part makes constant extension, and an superior part tends to force the head of the humerus into the articular cavity. But there is nothing to fix the scapula, and the compression made by the superior portion of the vertical piece of the machine tends to force the head of the humerus into the glenoid cavity, before it is well disengaged by the extension. — See *Boyer on Dissections of the Bones*, vol. 2.

AMBLYOPIA. From *amblyo*, dull, and *opsis*, the eye. Hippocrates means by this word, in his Aph. 21, sect. 3, the darkness of sight to which his pupils are subject. Modern writers generally understand by *amblyopia* *myopia*, *asthenopia*, or the weakness of sight attended with certain stages and forms of *lilas obscura*.

ADDONIA MURINA, ADDONIA MURINATA. Sol
arrivato. The chief use is surgery, as in an internal
cervical application.—(See Loco ADDONIA. Murina
(see Aorta.)

Mr. Juchaczewski recommends the following application in such abscesses: 6. Abscessus maxillae Tj. Squatina terna marina Sp., Muench. Lichen sage are to be used with the remedy, and kept continuously applied to the part affected.

There can be little doubt of the utility of this being in describing the information left after variously assumptions; but while these claims are underpinned with such such, however, and unfortunately, existing formalizations and methods are to be preferred.

If earthen of ammonia be mixed with its weight of powdered zinc, and dissolved in six or eight parts of water, it produces a very good farric, which may be used as a substitute for zinc in cases of strangled hernia.

AMPUTATION. The operation of cutting off a head, or other part of the body, as the *Amput. per. &c.*

Birth an opportunity frequently becomes a responsibility rather than the privilege of mere birth. A thought well used, for the sake of taking the only relevant chance of saving the trunk itself. Indeed the suggestion of this doctrine, in cases of identification, where there is no chance of the paper becoming, may be said to be derived from nature itself, who, by a process to which I shall advert in speaking of justification, directs

the soul from the living pain; this separation is followed by amputation, and the patient recovers.

The necessity for amputation has always existed, and ever will continue, as long as the destructive effects of injuries and diseases of the limbs cannot be arrested in any other manner. An Greek surgeon, *Strabo*, who was more a poet than a physician, about forty years ago, when the operation was more frequently practised than at present, and this fact is to be ascribed less to the ravages of syphilis than to the imperfection of the medicine which used to be employed for the fatal local diseases. For these diseases of the limbs, and some other cases, at present treated with success, were always deemed incurable without amputation. *Boissier*, *Gottsch*, *Four*, and *Rigault* struggled against the frequent performance of amputations on the head of public, and their arguments were more of little value; when a path were at the same time traced which would conduct us to the method of curing the evil circumstances which form the necessity for the operation. When this condition is fulfilled, and more efficient modes of treatment are devised, as for instance with respect to the gun-shot wounds specified by *Rigault*, then the necessity for amputation in such cases would cease of itself.—*Neuman für die Abhängig gewisser Krankheiten*, p. 12, 8vo. Berlin, 1822.

As the author of another valuable modern work has said, it is an excellent observation, founded on the patient humanity, and justified by the soundest professional principles, that in next one limb is inflicting more miserable in the surgeon, than to have performed hazardous amputations, between successful; but it is a fearful, but not unkindly, question, fully as true, that it is much better for a man "to live with three limbs, than to die with four."—*Hutton on Military Surgery*, p. 251, ed. 2.

To this saying should be added the reflection, that some unfortunate beings, informed by a false belief, have been known to submit to the loss of all their legs and arms, and yet recover. In the *Journal des Invalides* at Paris, mutilated objects are to be seen, who had lost all their limbs and arms so that, unless assisted, they could not see, and it was necessary to feel and walk upon them like new-born infants.—*Mémoires Opus*, de *Chir.* p. 185, and *Gratich*, op. cit. p. 22.

The amputation of the large limbs was severely punished under many disadvantages. The best way of making the incisions was unknown; the ignorance of the skill surgeons about the right method of stopping hemorrhage was the cause of a large proportion of the patients who had courage to submit to the operation; the mode of holding the wound by the first assistant was not understood, as we daily experienced; and the instruments were so awkward and clumsy, as the drawings were evincing and disgusting.

Modern practitioners have judiciously displayed all the chief operations in surgery; an object which has been accomplished not rarely by setting anatomical science to the main guide of their proceedings, and, simply by devising more painless and less painful methods; not only by diminishing the number, and improving the construction, of instruments; but also, in a very essential degree, by abridging the use of a multitude of external applications, most of which were useless or harmful.

The Greek, Roman, and Arabian practitioners attempted limbs with feelings of alarm, and, in general, with the most barbarous results, while modern surgeons proceed to the operation with feelings of horror, well knowing that it mostly gives *misericordia*, hence, as *Gratich* justly remarks, nothing can be more evident, than that the patient's safety must depend very much upon the kind of practice.—(*See Neuman für die Abhängig gewisser Krankheiten*, p. 12.) By practice is here implied the mode in which the operation is performed, the way in which the wound is dressed, and the whole of the after treatment.

It is much improved as amputation has been, it cannot be denied, that it is an operation as once terrible to bear, dreadful to behold, and sometimes severe and fatal in the consequences which it itself produces, while the patient, if saved, is left for ever afterwards in a crippled, mutilated state. Hence it is the surgeon's duty never to have recourse to so serious a proceeding without a perfect and well-grounded conviction of its necessity. Amputation should be generally regarded as the last expedient to which a surgeon ought to re-

sort; an expedient justifiably, as a late writer says, only when the part is either already gangrenous, or the seat of so much injury or disease, that the attempt to preserve it any longer, would expose the patient's life to the greatest danger.—*Dict. des Sciences Méd.* t. 1, p. 672.

Although, says a distinguished modern surgeon, this amputation is a confession, that the case of some local diseases is not within the limits of our art, yet, on the other hand, it furnishes a proof, that surgery may be the means of saving life under circumstances which, without its assistance, would inevitably have a fatal termination. The physician is adapted to the moral treatment; the nurse is exerted for the prevention of complications.—*Gratich*, op. cit. p. 18.

Nothing can be more almost or more misapprehended, than the confusion sometimes passed upon amputation, because the body is mutilated by it. And, although, as a modern writer remarks, the operation proves the limitation of human knowledge and ability, it must be very unfair on this account to throw blame on surgery, or the practitioners who thus serve the patient's life. For, without dwelling upon the fact, that a humane surgeon would never amputate through a mere love of operating, and without regard to value, one may safely ask, are his diseases in their nature curable? Does not the surgeon even sell as an exorable without consideration? And are not cases, which were in the beginning curable, often first brought to the surgeon, when, from neglect, they have become totally incurable? Is it not his duty then to employ the only means left for saving the patient? And is not the preservation of a weak and feeble life a compensation for the sacrifice? Would it not be just as reasonable to blame an architect, when the irretrievable loss of labour, or a bomb destroys his building? Indeed, is it not rather a greater honour to surgery, that even when death has already taken possession as it were, of a part, and a threatening inevitable destruction to the whole, it means to yet preserve not only of saving the patient's life, but of bringing him into a state in which he may recover his former good health?—*Erwinckmann, Entzündung und Hämorrhagien über die Amputation*, p. 11, 8vo. Berlin, 1818.

Though amputation is in every respect much better than in former times, and its right performance is by no means difficult, I would not wish to be thought to say, that it is always, or even usually done according to art, besides long opportunities of observation have convinced me of the contrary; and the remedy of the knife being not so fully handled in the part of surgery, may generally be ascribed to confusion, stupidity, laziness, or, what is as bad, a want of ordinary despatch. There are several egregious faults in the method of amputating, which even every hospital surgeon in this metropolis are guilty of; but these we shall find, when we discuss them, are for the most part easily avoidable, without any particular share of skill being required. A greater difficulty is to ascertain with precision, the cases which demand the operation, those in which it may be dispensed with, and the exact periods at which it should be performed. These are considerations requiring profound attention, and the highest talents. The most expert operator as Mr. O'Halloran observes, may not always be the best surgeon. To do justice to the work and operation, we must, in many cases, rather avoid this perfect surgical operations; and with respect to amputation, it we consider the many cases in which it has been unnecessarily undertaken, or done at unreasonable periods, it may be supposed, that this operation, upon the whole, may have done more mischief than good. At all events, it is not enough for a surgeon to know how to operate; he must also know when to do so.—*See O'Halloran on Gangrene and Suppuration*, p. 100.

For such reasons I shall first take a view of the circumstances, under which the best surgeons deem amputation necessary; though it may be proper to observe, that in each of the articles relative to the particular diseases and injuries which ever call for the operation, additional information will be offered.

I. Compound Fractures.

In a compound fracture the necessity for amputation is not altogether pronounced to the advantage of the accident, but still frequently depends at first upon other circumstances. For example, if the ball, and

on board of a crowded ship, it is not constantly in the surgeon's power to pay such attention to the cases demand, nor to provide for the patient the proper degree of rest and good accommodation. In the field, there is often a necessity for transporting the wounded from one place to another. Under these circumstances it is proper to have immediate recourse to amputation, in numerous cases of bad compound fractures, where of which, perhaps, might not otherwise cleaved the system, when the patient is so situated, so it is capable of feeling all the advantages of the best and most scientific treatment in a well-ventilated quiet house of hospital, furnished with every desirable convenience. At the same time daily experience proves, that there are many other cases, in which it would be improper to have recourse to the knife, even under the most unfavorable circumstances of the above description. So, when a compound fracture occurs, in which the soft parts have not been considerably injured; in which the bones have been broken in such a direction that they can be easily set and kept in their proper position, or in which there is only one bone broken, amputation would be unnecessary and cruel. But when the soft parts have been more extensively hurt, and the bones have been so badly broken, that perfect quietude and cleanliness cannot be required to afford any chance of recovery, it is a good general rule to amputate whenever these advantages cannot be obtained.

The bad air in crowded hospitals and large cities, a circumstance so detrimental to wounds in general, is another consideration which may seriously lessen the chance of curing a badly broken limb, and should be considered in weighing the reasons for and against amputation.

On this part of the subject, I feel the sentiments of Grant interesting. Besides an abstract, says he, there is a relative necessity for amputation: it is the most successful, and provides altogether the most satisfactory external circumstances, though, alas! in many cases hardly ascertainable, when life is to be preserved. In war, every loudly uttered phraseology of what has been stated. The number of the wounded to amputate; the number of surgeons for the day too limited. The surgeons must travel as at a distance. In these emergencies, though the military surgeon may, from nature and practice, be able to suggest the quickest method of obtaining what is wanted, know how to avail himself of every advantage, which circumstances present, and estimate tolerable substitutes for such things as are deficient, yet this will not always do. Were we, says Grant, here to complain of the government not providing due assistance for the defenders of our native soil, to assure the necessaries would only appear ridiculous. Yet they who manage the medical affairs of the Prussian army may not immediately have it in their power to avoid the inconvenience. The general cannot decide the number and service of the wounds which may happen, so as to enable the medical department to take with them exactly the apparatus required, without endangering the army with a subsistence of useless articles. The enemy, perhaps, captures the medical stores, or the rapid movements of particular corps cut them off from the principal depots. Details must often be sent at remote points. The hospitals may be several miles in the rear of the line; and, for want of means, the transport of the imperfectly-dressed wounded may continue night and day. Hardly are the sufferers brought into the nearest hospital, in the most painful state from pain, anxiety, and cold, when an order is given to break up, and they must be conveyed still further towards their grave; and a thousand other circumstances, as Grant observes, which deprive the wounded of the requisite attention and essential number of surgeons, together with the most necessary stores, make it desirable to stipulate every wound as much as possible; when, indeed, is the only reason of stipulating this, perhaps, that, while we are endeavoring to save one man's limb, we let another die.

Who doubt, says Grant, that a soldier with a gunshot wound, complained with a shocked state of the wound, may sometimes be saved, without loss of his limb, by employing all the means which the resources of surgery offer? But these very resources are often wanting in a campaign; and the business of dressing the patient would occupy the surgeon several hours daily, during which his useful assistance could not be extended to other sufferers. Notwithstanding this

most care, the removal of patients from one place to another frequently renders their wounds extremely dangerous, or fatal; and we now lose many a man, who, had he undergone amputation, would have been able to bear the journey.—See *Northern Star* for the following interesting observations, p. 15, 16.

From what I have seen of the ill effects of moving patients with bad compound fractures of the lower extremities, produced by gunshot violence, I am convinced that, as a general rule, it is better to perform amputation; but if that be not done, and an attempt is to be made to save the member, it will be more fortunate, when the army is retreating, and the enemy are not savages, to move such wounded behind, than subject them to all the trials and trials of hastily and roughly transporting them in such a condition. It gives the party sent forward to find the preceding regiment, commanded by Dr. Hensley, whose knowledge and experience in military surgery enable all his opinions to be given with the greatest confidence; in noting what ought to be done with the wounded, when the army is compelled to retreat, he says, "It is that increases the duty of a certain proportion of the hospital staff to devote themselves to their wounded, and become prisoners in war along with them, and in that, so as to ensure success in the art, experience, while it is painful to me, to believe that I have never witnessed, nor heard of, inquiry, all act of unnecessary severity practiced rather by the French or British armies on these wounded prisoners."

Compound fractures of the thigh, produced by gunshot violence, too often have an unfavorable termination, especially when the wound has been caused by gunshot or even a stoneball, fired from a moderate distance, and the patient is moved from one place to another after the receipt of the injury. In the military hospital at Glendaloch, in the spring of 1818, I had charge of about eight bad compound fractures of the thigh, of which cases only one enjoyed a final termination. This was an instance in which the wound was situated a little way above the knee. Another patient was relieved by amputation; the perils immediately arising from the effects of displaced state of the bone, the excessive injury of the tissues, and current abscesses, but was unfortunately lost by secondary hemorrhage. All these patients had not merely been struck by gunshot, or else by balls fired from a short distance, but they had been moved from Bergen-op-Zoon into my hospital five or six days after the receipt of the injury, the very worst period possible in a wound of the inflammation being then most violent. From the ill success of these cases, many a surgeon, who saw them, might be inclined to think that immediate amputation, ought generally to be performed for all compound fractures of the thigh so soon after the receipt of the injury as possible. And such is my own sentiment, whenever the accident has been caused in the system I have above specified, or whenever the patient must be moved any distance in a wagon after the occurrence of the injury. It may be right to state, however, that I have known more than one compound fracture of the thigh cured, when the accident had not been occasioned by gunshot violence, and I have been informed of one or two successful cases where the bone was broken by a pistolball. In St. Bartholomew's hospital, two compound fractures of the thigh were pointed out to me some time ago, as cases likely to end favorably. However, these may only have been lucky escapes, deviations from what is common, and not entitled to any stress, with the view of affecting the general excellent rule of amputating where the thigh-bone is broken by gunshot violence.

As Mr. Galt has accurately observed, one circumstance which increases the danger of fractures of the thigh from gunshot violence is, that the bone is very often broken obliquely, the fracture extending far above and below the point immediately struck by the ball.—*On Gunshot Wounds*, p. 191, 192. This disposition of the thigh-bone to be fractured by several inches when hit by a ball, and the violent danger arising from the occurrence, are also very particularly commented upon by the experienced observation, who has been surgeon-general to the Prussian armies in the campaigns of Frederick the Great.—See the *Vermischte Chirurgische Schriften*, t. 1, p. 39, 40, Berlin, 1763. In several of the cases under the care of Dr. Cole and myself in Holland, the bone was split lengthwise to the extent of seven or eight inches.

According to Schramm, all fractures of the middle or upper part of the tibia are attended with great danger. "But says he, if the fragment be situated at the lower part of the bone, the risk is considerably less, the fragment almost being as powerful, in such a case, therefore, amputation would not be performed before every other means are lost; being tried, and very frequently I have treated fractures of this kind with success, though the risk sometimes occurred still. But says Schramm, if the bone is completely fractured or splintered by a ball at its middle, or above that point, I never was for the bad operation to commence, but amputate ere they gangrene, and when the operation has been done early, even if, most of my patients have been cured. However, when some days had transpired, and inflammation, swelling, and fever had come on, I would usually caution them the issue was not always fortunate. Yet the operation should not on this account be diagnosed with; for if only a few days this is waited out of easily, some benefit is obtained, as, without this step, such few would also perish."—*Vermischte Chir. Section 2. l. p. 12.* When I have of compound fractures of the thigh, after the accident on Bergen-*op-Zoom*, we may remark, sometimes with the assistance of Schramm's single experience; on the only two patients who survived the bad symptoms proceeding directly from the fracture were, one whose femur was broken near the knee, and another whose limb I took off as an account of a fracture of the middle of the bone, accompanied with abscesses of surprising extent. The latter was a man, twenty, in which the limb ought to have been repaired earlier. The following remarks, by Mr. Galtier, I consider judicious and correct.

"The danger and difficulty of cure attendant on fractures of the femur from gun-shot wounds, depend much on the part of the bone injured; and in the consideration of these circumstances it will be useful to divide it into five parts. Of these, the first and neck included in the capsular ligament, may be considered the first; the body of the bone, which may be divided into three parts, and the apical portion of the lower end of the bone exterior to the capsular ligament, forming the fifth part. Of these, the fractures of the first kind are, I believe, always ultimately fatal, although life may be prolonged for some time. The upper third of the body of the bone, if badly fractured, generally causes death at the end of six or eight weeks of acute suffering. I have seen few cases, and then not with a useful limb that had been badly fractured in the middle part. Fractures of the lower or fifth division are in the next degree dangerous, as they generally affect the joint; and the lower diagnosis are fractures of the lower third of the body of the bone. Of these even I do not mean to conceal, that when there is even slight tenderness the danger is great, so that a fractured thigh by gun-shot, even without particular injury of the soft parts, is one of the most dangerous kinds of wounds that can occur."—*See Galtier on Gun-shot Wounds, p. 120.*

In compound fractures, as Mr. Pott has correctly pointed out, there are three points of time when amputation may be proper. The first of these is immediately or as soon as possible after the receipt of the injury. The second is, when the bones contain the great length of time without any disposition to unite, and the discharge from the wound has been so long and so large that the patient's strength fails, and general symptoms denoting disorganization come on. The third is, when a suppuration has taken such complete possession of the soft parts of the inferior portion of the limb quite down to the knee, that upon the separation of each part the bone or bones shall be left bare in the extremity.

The first and second of these are matters of very serious consideration. The third hardly requires any.

When a compound fracture is caused by the passage of a very heavy body over a limb, such, for instance, as the broad wheel of a wagon or loaded cart, or by the fall of a very ponderous body on it, or by a cannon-shot, or by any other means so violent as to break the bones into many fragments, and so to tear, bruise, and wound the soft parts, that there shall be good reason to fear that there will not be power sufficient to carry on the organization with the parts below the fracture, it becomes, as Mr. Pott observes, a matter of the most serious consideration, whether in attempt to save

such a limb will not involve loss of life. This consideration must be before any degree of inflammation has spread the joint, and that the best is to immediately after the knowledge. When inflammation, tumour, and disposition to gangrene in the limb have arisen, the patient is highly disagreeable for operating, and the patient's situation at being seized by gangrene under these circumstances are much smaller than before the discharge has brought bad takes place. At the same time, there are certain examples of institution from external causes, when, as far as the can judge from the results of later experience, as that of Mr. Pott, the surgeon should not defer amputation, even though the disorder be put in a gangrenous state attended with considerable swelling and serious tendency for up the limb. This is a slight, however, which will require more explanation hereafter.—But what is presently sought is Mortification; nor are the cases to which reference is made meant to affect the general tenor of the observation delivered by the most experienced surgeons of every age, that when a limb is almost very wasted and stiffened, with a part of it either in a state of spreading mortification, or ready to become gangrenous, the period is so unfavorable for amputation, that very few patients so circumstanced ever recover after the operation. Nor is it meant to be insinuated, that in the very cases which form exceptions to the general rule of not amputating before the tendency to gangrene has ceased, the patient might not have had an entirely better chance of his life, had the operation been done immediately after the first receipt of the injury, before any disposition to gangrene had had time to be produced.

The necessity of amputation or very early dissection, in these cases makes it a very delicate part of practice; for however pressing the case may seem to the surgeon, it will not, in general, appear in the same light to the patient, to the relations, or to himself. They will be inclined to regard the proposition as arising from ignorance, or an inclination to save trouble, or a desire to operate; and it will often require more firmness on the part of the practitioner, and more resignation and confidence on the part of the patient, than is generally met with, to submit to such a severe operation in such a serious injury, and upon so little apparent deliberation; and yet it often happens, that the suffering and point of time to pass decides the patient's fate.

The necessity of many dissections arises from the quick tendency to mortification which exists in the injured limb, and too often ends in the patient's death. That this is no exaggeration, says Pott, immediately and frequent experience evinces, even in those whose conditions previous to the accident were in good order; but such state in these who have been treated by violent exercise, or labour, or fatigue, or who have led very debauched and unregular lives, or who have habits usually intemperate and irritable. This is often the case when the fracture happens in the middle part of the bone, but is much more likely to happen when any of the large joints are concerned. In many of these cases a determination for or against amputation is really a determination for or against the patient's existence.

That it would have been impossible to have saved some limbs which have been cut off as soon as they presented to any; but this does not render the practice imprudent. Do not the majority of those who get into the above fatal condition, and whose dissections are not performed, perish in consequence of their wounds? Have not many even been preserved by amputation which, from the same circumstances, would otherwise most probably have been lost?

Pressing and urgent as the state of a compound fracture may be at this first point of time, and it will be a matter of choice whether the limb shall be removed or not; but at the second period the operation must be submitted to, or the patient must die.

The most disagreeable appearances at first do not necessarily or constantly end unfavorably. Sometimes, after the most threatening first symptoms, after considerable length of time, great discharges of water and large exfoliations of bone, various shall ultimately be removed, and the patient shall recover the limb and the use of his limb.

But sometimes after the most judicious treatment through every stage of the disease; after the united efforts of physic and surgery; the case, instead of gratifying kindly, and continuing daily to be smaller

the shall remain as large as at first, with a raw, spongy surface, discharging a large quantity of thin mucus, instead of a small one of good matter; the fractured ends of the bone, instead of uniting to exclude pyætic matter, will instead so perfectly loose and detached as at first, while the patient shall lose his sleep, his appetite, and his strength; a hectic fever, with a quick, weak, hard pulse, profuse sweats, and delirious purging, continuing at the same time to bring him to the brink of the grave, notwithstanding every kind of abstraction: in these circumstances, if amputation be not performed, Mr. Pott asks, what else can preserve the patient from destruction?

The third and last period is a matter which does not require much consideration. Too often the inflammation consequent upon the injury, instead of producing abscess and suppuration, tends to gangrene and mortification, the progress of which is often so rapid, as to destroy the patient in a very short space of time, notwithstanding that very act of cure in which amputation should have been immediately performed. But sometimes even this dreadful malady is, by the help of art, put a stop to, but we trust it has totally destroyed all the surrounding vessels, tendons, and sometimes quite down to the bone, which, upon the supposition of the united parts, is left quite loose, and all circulation between the parts above and those below is by this totally cut off. Is this sufficient whether the stump may through the bare bone or bone the membrane to be affected by matter, the patient must lose his limb.—See Pott's Remarks on the Necessity, &c. of Amputation in certain Cases, &c. Chir. Works, vol. 2.

For the consideration of a variety of complicated cases which affect the question of amputation in compound fractures, I must refer to the article Gunshot Wounds.

2. Extremities perforated and lacerated wounds.

These form the second class of general cases requiring amputation. Wounds without fracture are not often so bad as to require this operation. When a limb, however, is extensively comminuted and lacerated, and the principal bloodvessels are injured, so that there is no hope of a continuance of the circulation, the immediate removal of the member should be recommended, whether the bones be injured or not. Also, since no effort on the part of the surgeon can prevent a limb so injured, and such wounds are more likely to mortify than any others, the sooner the operation is undertaken the better.

In these cases, as in those of compound fractures, though amputation may not always be necessary at first, it may become so afterwards. The foregoing observations, relative to the second period of compound fractures, are equally applicable to badly lacerated wounds, attended with injury of the bones. Sometimes a rapid mortification comes on; or a putrid suppuration, which the system can no longer sustain.—(Cyclopædic Methodique; *parle Chir.* t. 1, p. 86.)

2. Cases in which part of a limb has been carried away by a cannon ball.

When part of a limb has been torn off by a cannon-ball, or any other cause capable of producing a similar effect, the formation of a good and serviceable stump, the greater facility of healing the clean, regular wound of amputation, and the benefit of a far more expeditious, as well as of a surer cure, are the principal reasons which here make the operation advisable.

This was an instance, in which some former surgeons disputed the necessity of amputation. They, urged as a reason for their opinion, that the limb being already severed, it is better to endeavor to save the wound as speedily as possible, than increase the patient's sufferings and danger, by making him submit to amputation. It must be remembered, however, that the bones are generally shattered, and reduced into numerous fragments, the tendons and vessels are completely divided, and their ends torn and confused. Now, none of the old surgeons questioned the absolute necessity of extracting the splinters of bone, and cutting away the irregular extremities of the tendons and vessels, which operations would require a longer time than amputation itself. Besides, we should recollect that, by making the incision above the injured part, so as to be enabled to cover the bone with flesh and membranes perfectly free from injury, the extent of the

wound is at diminished, that the healing can be accomplished in one-third of the time which would otherwise be requisite, and in which former cases is also obtained. Such operations must therefore be, that amputation here holds forth very great advantages. It cannot increase the patient's danger, and as for the necessary sufferings of pain which he suffers, he is amply compensated by all the benefits resulting from the operation.—(See Gunshot Wounds.)

4. Mortification.

Mortification is another cause, which, when introduced in a certain degree, renders amputation indispensably proper. When introduced, too, and progressed fractures and wounds often terminate in the death of the individual. Such surgeons as have been distinguished, at all events, to oppose the performance of amputations, have maintained, that the operation is here totally useless. They assert, that when the mortification is only in a slight degree, it may be cured, and that when it has spread to a considerable extent, the patient will perish, whether amputation be performed or not. But this way of viewing things is so contrary to facts, and the experience of every rational practitioner, that I shall make no attempt to refute the assertion. While it is allowed that it would be very bad practice, to postpone an every slight appearance of gangrene, it is equally a fact, that when the disorder affects the substance of a member, the operation is generally the safer and most advantageous measure. Nay, there are, as we shall presently see, certain forms of mortification, in which the early performance of amputation is the only chance of saving the patient.

Practitioners have entertained very opposite opinions, concerning the period when one should operate in cases of mortification. Some contend that whenever the disorder presents itself, and especially when it is the effect of external violence, we should amputate immediately; the mortification has decidedly begun to form, and while this mischief is in a spreading state. Others believe, that the operation should never be undertaken before the progress of the disorder has stopped, even not till the dead part has begun to separate from the living one.

The advocates for the speedy performance of amputations declare, that the farther progress of the mortification may be stopped, and the life of the patient preserved, by cutting above the part affected. However, according to the reports of the greater number of experienced surgical writers, this practice is highly dangerous, and unbecoming of conviction. Whenever pain may be taken, in the operation, only to divide sound parts, there is no certainty of succeeding in this object, and the most skilful practitioner may be deceived. The skin may appear to be perfectly sound and free from inflammation, while the tissues which it covers, and the parts immediately surrounding the bone, may already be in a gangrenous state. Between when the soft parts are found free from apparent disorder, and making the incision, still, if the operation should not have waited till the mortification has ceased to spread, the stump will almost always be attacked by gangrene. Surgeons who have had opportunities of frequently seeing wounds which have a tendency to mortify, entertain the latter opinion. Such was the sentiment of Pott, who says that he has often seen the experienced mode of amputating a limb in which gangrene had begun to show itself, but never saw it succeed, and it invariably hastened the patient's death.

The operation may be postponed, however, too long. Mr. R. Sharp, in particular, recommended the much delay, advising the operation never to be done, till the natural separation of the mortified parts had considerably advanced. Mr. Sharp was a witness of numerous operations, and his authority carries with it the greatest weight. But, perhaps, he was too weak in his opposition to a practice, the peril of which he had so often beheld. When the mortification has ceased to spread, there is no occasion for further delay. We have stated, just as certainly, all the benefits of the operation, and got rid of a mass of pathology, the calculations from which justify the amputation which the patient breathes, and are highly detrimental to his health. Nay, according to the reports of writers, patients in these circumstances may actually fall victims to the absorption of the putrid matter which is suffered to remain too long. However, this danger would not be

[illegible]

*The University and other institutions of America, and its
future development.*

Cancerous metastases, however, and malignant intracranial tumors in the brain, sometimes cause an irritation or a state of anxiety, or a feeling of constant, or slight, constant pain, but in no instance can be proved either to be internal or any kind of organic condition, and there is nothing, except the total separation of the part affected, cases where any rational hopes of cure can be held. Cancer is not frequently seen on the extremities. Every case of cancerous tumours, however, sometimes have seen in the situation, if not actually cancerous disease, pain or irritation, and which cannot be cured except by removing the affected part. This may often be accomplished without cutting off the whole limb. But when the disease has spread beyond certain bounds, amputation above the part affected is the only thing in which recovery can be had with any hope of success. Sometimes, when the operation has been delayed too long, even amputation itself will not effect a cure. In a few cases of finger amputation, the operation has succeeded, however, after the disease had disappeared, and a cure had been seemingly achieved by the removal of the diseased part. Yet, from what I have seen of finger amputations, I should much rather believe the best is achieved by amputation would be sooner, as when this disease shows itself only externally, internal organs are rarely or the more true statement affected.—*Rev. Francis H. Stoddard.*

Because computers, there is a great need, which may be considered a political problem. Thus, when an extensive study of any sort whatsoever, is actually completed, the health benefits instead of pointing to new ideas, it becomes larger and more (infinite) extent, in short, it puts life in a new danger; argumentation should be a friend.

6. *Gamma* *Gamma*.

That there are numerous seedlings, which destroy the foliage of the tree by sucking their juices, says a very doubtful statement, and bringing the patients into the most deluded state, by that of superstition sustained by them. When such persons get neither the depressed one, nor get with safety, respiration of the lungs is not very common.

Mr. Pitt has particularly described a flower affording the key to which the operation is sometimes successful. It was so near to the middle of the leg as rather more towards its apex, just under the gastrocnemius and tibiae crurales. It begins by a small, hard, deep-seated swelling, sometimes very painful, sometimes less affixed, and may increase very

patient's recovery. It does not alter the natural color of the skin, at least until it has attained a considerable size. It enlarges gradually, does not soften as it enlarges, but contracts through the greater part of it is inconspicuously hard, and when it is put to a large size it seems to contract a fluid, which may be felt towards the bottom, as pulsing, as it were, on the back part of the tumor. It is an opening to enable for the discharge of the fluid; it must be made very deep, and through a strictly disorganized mass. This fluid is generally coral in quality, and consists of a serum mixed with gelatinous fluid; the discharge of it produces very little alteration of the tumor, and very high symptoms of suppuration and inflammation come on, and, advancing with great rapidity, and most exquisite pain, very soon destroy the patient, either by the fever, which is high and unrelenting, or by a mortification of the whole leg. If suppuration has not been procured, and the patient dies after the tumor has been freely opened, the inverted and partial state of the parts presents all the symptoms of suppuration; but if the fluid was removed, without any previous section, and which Mr. Parr, in his experiments, found to be the only way of procuring the patient's life, a suppurated fluid artery will be found to be enlarged, disorganized, and hard; the remainder of the vessel to have been converted into a stringy fibrous mass; and the posterior part of both the iliac and ilio-lumbar to be contracted.—PARR ON ANEURISM.

It seems only necessary to add, another species of tumour to illustrate the form of angiosarcoma. The following case is related by Mr. Abernethy. A patient was admitted into St. Bartholomew's Hospital with a hard tumour in the arm. It was about five inches in length, and three in breadth. One had also a tumour in front of the thigh, a little above the patella, of four or five in diameter. The tumours in the arm, by its pressure on the superficial vessels, had greatly lessened the sensibility, and obstructed the circulation of the leg, so that the limb was very edematous. As it appeared dangerous to preserve the patient, and his age and constitution were advanced, amputation was performed. On examining the amputated limb, the tumour in the arm could only be divided with a saw. Several slices were taken out of it by this means, and appeared to consist of a conglomerate and vascular substance, in the intervals of which a great deal of honey matter was deposited. The remainder of the tumour was incised and dried, and is appeared to be formed of an irregular and compact deposition of the walls of blood vessels. The tumour on the front of the thigh was of the same nature as that of the arm, but contained no little fluid, so that it could be put with a knife. The thigh bone was not at all diseased, which is mentioned, because, when honey matter is deposited in a limb, it is generally arising from the disease of a bone.—*Surgical Observations*, 1804.

Before the late thirties and improvements relative to the treatment of aneurysms, these cases, on the extremities, were generally set down as requiring amputation. Even Mr. Pott, and J. L. Petit, wrote in recommendations of such practice, and their observations on this subject are among the few parts of their writings which the enlargement of surgical knowledge, since those times, has rendered dispensable. The surgeon is seldom the knower of first principles, this erroneous doctrine belongs to A. N. Goussard, who opposed the advice dictated on this subject by Petit.—*Häufig Recid. Chir.* vol. 3, p. 103.

A third example of these remarks on the cases regarding inspiration, with advancing purposes, serves to illustrate this serious situation, without considering the opinions of other environmentalists, who are not of the view as he demands. The best operators are those of course in that involving the kind of judgment by which the more absolutely demanding inspiration has been considered from others, in which the question may be merely postponed, and a chance of pursuing the right.

Nicholas Breckenridge Association

The history of migration confirms that the steps of slavery to perfection are slow, and that they even sometimes deviate from the straight path, though several essential points on retrogression have never taken place. Here slavery has acted as the guide, and the stepson's chief merit has consisted in observing the

1941. "Do You Recall as Glassboro, N. J. The
all the Advertisements were actually presented
to more of participation; further they were afraid
and the present, and all the other business of
Helen, may be said to have been changed in the whole
largest and most active business centers."

The kind of animals were not native to the region, and even a casual naturalist might have noticed the foreign-looking animals. The Aztecs had, for example, a variety of birds, including the turkey, which was a common food source. The Aztecs also had a variety of animals, including the dog, which was a common pet and a source of food. The Aztecs also had a variety of plants, including the corn, which was a staple food. The Aztecs also had a variety of tools, including the stone axe, which was a common tool for cutting and chopping. The Aztecs also had a variety of weapons, including the spear and the bow, which were used for hunting and warfare. The Aztecs also had a variety of clothing, including the tunic and the skirt, which were made of cotton and wool. The Aztecs also had a variety of jewelry, including the necklace and the bracelet, which were made of gold and silver. The Aztecs also had a variety of art, including the pottery and the sculpture, which were made of clay and stone. The Aztecs also had a variety of music, including the song and the dance, which were performed at festivals and ceremonies. The Aztecs also had a variety of games, including the ball game and the board game, which were played for entertainment and competition. The Aztecs also had a variety of religious practices, including the sacrifice and the prayer, which were performed to the gods. The Aztecs also had a variety of social structures, including the family and the community, which were based on kinship and shared resources. The Aztecs also had a variety of economic activities, including the agriculture and the trade, which were essential for their survival and growth. The Aztecs also had a variety of cultural achievements, including the calendar and the writing system, which were developed by their scholars and priests. The Aztecs also had a variety of historical events, including the conquest and the fall of their empire, which were recorded by their chroniclers and historians. The Aztecs also had a variety of legends and myths, which were passed down from generation to generation. The Aztecs also had a variety of customs and traditions, which were unique to their culture and identity. The Aztecs also had a variety of values and beliefs, which shaped their worldview and behavior. The Aztecs also had a variety of challenges and struggles, which they overcame through their resilience and determination. The Aztecs also had a variety of successes and achievements, which they celebrated with pride and joy. The Aztecs also had a variety of relationships and connections, which they maintained with their neighbors and allies. The Aztecs also had a variety of roles and responsibilities, which they fulfilled with dedication and skill. The Aztecs also had a variety of dreams and aspirations, which they pursued with passion and courage. The Aztecs also had a variety of fears and anxieties, which they confronted with bravery and faith. The Aztecs also had a variety of joys and pleasures, which they enjoyed with gratitude and appreciation. The Aztecs also had a variety of sorrows and hardships, which they endured with patience and strength. The Aztecs also had a variety of hopes and expectations, which they held with optimism and faith. The Aztecs also had a variety of regrets and mistakes, which they learned from and grew from. The Aztecs also had a variety of loves and passions, which they cherished and protected. The Aztecs also had a variety of hates and dislikes, which they expressed and managed. The Aztecs also had a variety of friends and enemies, which they dealt with wisely and justly. The Aztecs also had a variety of secrets and mysteries, which they guarded and shared. The Aztecs also had a variety of wonders and marvels, which they explored and admired. The Aztecs also had a variety of adventures and discoveries, which they embarked on with curiosity and excitement. The Aztecs also had a variety of triumphs and victories, which they celebrated with honor and glory. The Aztecs also had a variety of defeats and losses, which they accepted with grace and humility. The Aztecs also had a variety of beginnings and endings, which they marked with ceremony and reflection. The Aztecs also had a variety of cycles and rhythms, which they followed and harmonized. The Aztecs also had a variety of patterns and designs, which they created and appreciated. The Aztecs also had a variety of colors and textures, which they used and enjoyed. The Aztecs also had a variety of sounds and smells, which they heard and smelled. The Aztecs also had a variety of tastes and smells, which they tasted and smelled. 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ing that remainder with a red-hot knife.—(Citation 10, p. 27, p. 48.) In the middle ages, little time was given to the preparation of dissections. In the 14th century some more systematic and more applied method supplanted a mere, so that an attention to cases related here presented themselves in which the principal means of not differing superficial rural examinations had come out, but in overlooking the matter by the operation, out it to have struck an intelligent surgeon. This might also expect that practitioners would now have been led to make the light and the sound dark. What formerly the attention of physicians and its immediate consequences in surgery, happened at a period when patients were all qualified to practise the art of medicine of experience and better than. The treatment of these practitioners furnished them with the first lesson how they ought to act, and these were themselves too easily convinced at the sight of the diseases of which they were reminded, so as to be able to form any correct opinion about causes and effects. Their first idea was, that the terrible symptoms proceeded from the parts being actually burned, and they afterward inclined to the belief that gas was towards were produced from the red charred matter of the burnt tissue collected, and, as this is a common experience, however, these names passed under a new veil, for which there were some cases as the place of origin.—(Schäfer, *deutsche der Antiquar.* 18.) This desperate state was the natural result of the depravity of science in general, and of the leading art in particular, at the epoch to which I now refer. In the middle ages, as they are called, the preparation of all Europe was plunged in the deepest ignorance, and wherever there was knowledge, whether of the arts or languages, was monopolized by the priesthood, the professors of those times, who, instead of studying the nature of nature, wasted most of their time in discussing the doctrines of fathers. Surgery itself sank to the lowest state, as may be well conceived from the curious account of Rhazes by Pope Innocent the Eighth, forbidding any of the clergy to do anything themselves which drew blood; and of course all the operative part of surgery, that which required the hand skill and science, was intrusted to a set of illiterate, low-down rascals, far inferior to the same country doctors of modern times. Yet the clergy, who were then universally devoted to making their own bodies well blood, or having their own bodies healed by viewing the signs of their own diseases submitted to surgeons, had no hesitation in seeing the physicians and doctors of the profession or in having over these poor sufferers to men more qualified to soothe and murder than to give relief; and, what nearly stamps all forcibly, the same professors of Christianity who continued to give a class of blood themselves on a proper occasion, as Haller observes, eagerly took a hand, and acted an important part, as they were naturally men, when it was possible for them to interfere. In these dark ages of surgery, the science delivered by Galien was removed by Theodorus, who used to practise upon men and brutes, previously to the operation, the purpose of rendering the patient less sensible to pain, and afterward vinegar had found a more agreeable way with the view of lessening the debilitating effects of the primary medicine.—(Citation 10, p. 12.)

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At the end of the 19th century, the revival of learning occurred first in Italy. Now many began to study for themselves again, and physicians turned from conventional and scholastic medicine to the consideration of nature. Anatomy was calibrated with great ardour, and made brilliant progress under the strenuous character of the time: Be la Torre, Bolognini, Cenci, Vesalini, Fallopius, Rivisaviera, and others, who were able to do the most part very distinguished surgeons.

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superior. To teach the method of applying medicine in cases of wounded soldiers and sailors was understood, yet from some uncontrollable causes the practice was never brought to its antiquations. Even Europeans knew of no other means for stopping the bleeding but cauterizing... De Tost, *op. cit.*, p. 612. On the whole, the stopping of bleeding was not intended with a degree of cautious proportion to the advances of the healing art in general. Straps, bands, and compresses

were indeed to seed the hatchery, but as the circulation of the blood was not yet correctly known, they were not applied in the proper places, being arranged either close to the wound, or several of them put at random round the fish. The effect of such ignominiously light, long-continued cauterisation could be nothing less than paralytic, and hence the actual cautery was still slowly employed. The safer means for suppressing hemorrhage would not yet have been known.

perished in the university and 21 emigrants of such importance, 2, in Vigo (Francisco in Chilivaca, Correas, 181, Barrio, 134), and Fabrice in Montevideo (19, 134). Verbe 1623, disapproved of suspending in the saint fish, and returned to the principle mentioned by the academy, of making the incision in the mortified parts. Others endeavored to lessen the pain of the incision by the application with which the fish was removed, and the instantaneous application of the same

ly. The tharsopore L. Donat invented a sort of pellicule, by means of which a tentacle was covered from the body as an insect (the *Cremaster subserpens* Linnaeus, Läng. 1759), whose whole last a stump was from the back, and effected the dismemberment by the force of a wooden mallet. An example of this tortuous process is revealed by *Polidura blanda*, called by its name again the pithy and movement of the German language. In consequence of the loss of blood-

before he knew of the cost of the ligature, he was fully acquainted with exposure with a red-hot knife, an representation of which is given in his work. — (The program of Syllabus, Op.) Hitherto became a further article, however, as he grew older, and as the end only contributed to the firmness of the operation, through as he made the business complete in the mind, and adopted the method of tying the arms, as they usually appeared in the case of the victims.

Andreasen, Mary, a Finnish immigrant, who flourished in the 19th century. (*Opera, Pianos, 162*), and is referred to in the *Historia*.—Op. p. 817. One of his friends was a friend that he met for the first time, and a letter mentioning his father, back the morning. *Amusing Speeches, Goodrich, Am. Char. p. 4, p. 467*, his observations on the past, presenting the opinions on the same.—Op. p. 807, 824.

the sloughs were as long as being thrown off. He applied a ligature round the limb, two inches above the point of the amputation, and, drawing up the muscles, made the incision with a large curved knife, with the back of which he scraped off the psoas muscle. The leg, as well as reflexor, employed by Falgout-Hill, was, without doubt, unnecessary, as the muscles spontaneously drew themselves up as soon as divided. He tied the blood-vessels after separation of the part, and discovered all kinds of the same. After the operation, he drew the flap over the bone, and after having done this in this position with stitches or a tight bandage, though he generally preferred the former, as the utmost means of keeping the end of the bone from protruding. Across the stump he laid a pledge of dress-wool, and over this a thick layer of Armenian balm and other styptics, and the whole was covered with a India's bladder and a roller, applied spirally from the upper part of the remaining portion of the limb down to the extremity of the stump. On the third day, the dressings were taken off, and a digestive dressing applied. — *Chirurg. Transact.* vol. 5, p. 299, 300, Lond. 1803.

From this time, expectation may be considered as being an infinitely safer proceeding than what it used to be. For, as we have explained, the ligature of the arteries was now practised and succeeded in Germany by P. Hahnemann, in England by Wismann, and in Prussia by Dieffenbach. Many, however, continued to do the wound was large, and supplicated long and profusely; the healing was slow; the ends of the bone protruded, and, growing far beyond the soft parts, required the cure so long, that the patient was not infrequently worn out. Hence the best surgeons began seriously to consider what further could be done, with a view of lessening the exposed surface of the wound, and making a better covering of bone for the ends of the bone.

According to Sprengel, most of the old surgeons preserved a flap of flesh, and he is therefore by no means disposed to reject our countrymen, Lowdians, as the authors of this method, though it is acknowledged that the latter surgeons' practice was never introduced on the flap was formed by making an oblique incision through the aneurysms from below upwards. — See James Yonge's *Curios Transactio* et *Veritas*, 4to. Lond. 1678; and Sprengel's *Gelehrte Art. Chirurg.* 1, 1, p. 408.

Thus, if Sprengel means that many of the old surgeons endeavoured to preserve a partial covering of flesh for the bone, there can be no fault or loss of correctness; because we find, that they drew back the flesh before they divided it, and Celsius and some others ran did more, for, after cutting down to the bone, they detached the flesh further from it spirally, previously to taking the bone; but, on the contrary, if Sprengel wishes us to believe, that these were practitioners who, previously to Lowdian, in the operation of amputation formed what in England is usually understood by a flap, that is, a portion of flesh, possibly of a semicircular shape, and saved particularly from one side of the incision for covering the bone, I cannot see any reason for excluding with Sprengel's observation. Upon the merit of Lowdian's experiment, and the practice and principles as related by J. Yonge, were reflections lately sent me by Mr. Christopher I think with great pleasure, as perhaps he is right in thinking that the third edition of this work did not do justice to the accuracy of the latter writer.

"At the time Yonge wrote 1678," says Mr. Christopher, "it was supposed impossible to heal a mass before the bone had solidified, and therefore no surgeon would venture upon an attempt at making the surface to the best advantage. Now this truth by the first intention was the chief object of Mr. Yonge in proposing the flap operation, and it is to be seen, not only in Mr. Ainslie, who wrote precisely half a century after him, but in the numerous authors of this improvement. It is related in a letter addressed to his friend Thomas Jones, Esq., in London, dated Plymouth, Aug. 10, 1775, and published 1779, at the end of his *Curios Transactio* et *Veritas*. It begins thus:

"Sir, I find by yours that you are satisfied with the instrument I gave you, of a way of amputating large vessels, so as to be able to cure them yet without any other wound; and without losing or scaling the bone. It is a manner which I will now advise to you to be a little after I have first taken notice of what you desire, that there is a necessity of scaling

the ends of those bones left bare after the usual manner of amputating; before the stump can be exactly cured; that you never yet found it otherwise, so that when it had been attempted, the masses have spontaneously, and the cure came off thereby."

Yonge then acknowledges, that it was from an ingenious Doctor, Mr. C. Lowdian of Exeter, that he had the first hint thereof. He then describes the operation—the laying down the flap over the face of the mass, and sewing it by four or five stitches, &c. After this, Yonge proceeds without methoded measurement of the advantages of this mode of operating over all others then in use, viz. that it is more speedy—the cure not occupying a fourth of the usual time—no suppuration—no inflammation—no danger of metastasis—no liable to break open again from slight injury—and lastly, much better adapted to the patient from an artificial leg, &c.

The foregoing account will show says Mr. Christopher, how far Mr. O'Halloran's method, presently to be described, in which he divides the flap and the stump as distinct surfaces, can be regarded as a revival of Lowdian's operation, or whether it has been suggested or improved upon by the mechanical ingenuity of the Irish and French surgeons—the advocates of M. de la Faye and Vachon appear to have been merely envious and malicious spectators for the suppression of foreignness. Gargrave's opinion had also for its object to supersede the use of the flaps, which, however, after twelve years' practice, he was obliged to give up, and the second author has laid down the flap, the particulars of all these methods the reader will presently meet with. Therefore, therefore, founded upon the practice of those gentlemen, I venture, saying fairly is admitted as evidence against the day-operation of Lowdians, which nevertheless appears sinking in the estimation of the best modern surgeons; perhaps for various advantages is gained by it over the common mode of operating in the lower extremities, as now practised—but even here does not mean where we are glad to resort to it: a few years since, I attended a patient in consultation with a friend at Danvers, in Essex, where we thought it necessary to remove a large leg for a cancer of the tibia. An incision in front extended so high, that no integument could be saved, and the limb would have been remained above the knee, if I had not suggested the propriety of making a flap from the side of the leg. The tibia was obliged to be saved as high as possible, but the flap was left sufficiently long to cover the surface, and that most important object, the head of the knee, was preserved, to bear the pressure of a wooden leg. In the removal of the arm at the shoulder-joint, doubtless the advantages of making a flap from the distal are sufficiently established, but in the mode of dressing, I perceive that an English surgeon will admit, that the practice of M. Larrey (perhaps the most eminent surgeon that has been formed by the wars of Bonaparte, and whose practice will be beneficially noticed in the sequel) the method of Yonge or Lowdian, who wrote 14 years before him! Larrey introduces flaps to break the flap to prevent tension by the first intention! Lowdian's object is simply to lay the flap over the wound to prevent eversion, and to keep the surface "per se appressed" in those vessels."—To the correctness of these statements of Mr. Christopher, I believe that every impartial surgeon will bear witness; and it is very far from me to think him for his slight commendation, and say, that I have commonly looked over the copy of the *Curios Transactio* et *Veritas*, preserved in the valuable library of the Medical and Chirurgical Society, and find, that what he has stated is fully confirmed by the contents of that ancient work. At the same time, I retain the belief, that the example set by Mr. Ainslie, with respect to the proper method of dressing stumps and obtaining a speedy union of the wound, is entitled to the praise of posterity; because his advice was so well executed that it soon produced a revolution in practice, while the correct suggestions of Lowdian and Yonge, like the hair in Othello of the double incision, had sunk into oblivion, or were only known to a few adherents of surgical antiquity.

As Sprengel remarks, Pottius, Biondi (*Opera* d'Opera de Chir. p. 441), De la Voisignie (*Tratt. Chir.* 2da Ediz. 1804, p. 231), and most other surgeons of the seventeenth century, contained the author of first drawing up the integuments, and then

applying a band round the member. Heals also took particular pains to recommend the ligature of the vessels, and expressed a strong aversion to the actual cautery. Neither did he express an aversion to the knee joint, because he thought that the joints, which must be left behind, would impede the healing of the stump, and he was apprehensive of the artificial surface of the lower extremity discolored. He la Verugnon relied upon the astringent properties of nitric acid, and he praised drawing back the muscles by means of the kind of ligament by Fabrice's filigree.

Taking off the limbs at the joints was first recommended again in another time by J. Mercurio, who was more partial to styptics than the ligature; and he drawing the wound employed compressed styptic powder.—*Chirurgia*, p. 181.

Mansueti de la Mothe adopted the plan of operating recommended by Divius; he was also one of the first who made common use of the ligatures in operations, afterwards drawing out the vessels with the forceps and tying them.—*Trattato Chirurgico*, de Chiar. vol. 2, p. 111. Lousiana's original suggestion of amputating with a flap has been briefly noticed. About eighteen years after Vesalius's publication, Peter Verduin, an excellent surgeon at Amsterdam, referred to the judgment of the professors a new kind of flap-operation, which he had put in practice.—*See His Recueil des Nord Américains*, de la Chirurgie, tom. 2, p. 100. The following are the chief particulars of Verduin's flap-operation.

Two compresses were applied, one under the heart, and the other on the course of the large vessels. The thigh was wrapped in a fine linen cloth, which was sustained by some turns of a roller. The operation was covered with a piece of leather, six inches broad, furnished with three straps with buckles, so secure it round the part. The instrument was placed in the usual manner. The part above the place intended to be amputated was supported with a leather strap. The joint of a crooked knife, which was made to pass as near as the back part of the bones as possible, was thrust in on one side of the leg, and made to come out on the other. The knife was then carried down nearly to the tendo achillis, and thus a septum across the whole calf of the leg. The flap being formed, the operation was finished in the ordinary manner. The wound was then washed with a wet sponge, in order to clear it from the fragments of sawed bone. The leather strap, which served to secure the flaps, was next loosened, and the flap laid over the stump. The wound was dressed with hydropic, salt, and rose, over which was put a cushion, sustained by strips of sticking-plaster. Upon this cushion was placed an instrument called a retentorium, consisting of a compress, and a spongy roller, which were made to press upon the stump, by means of two straps, which crossed each other and were attached to the broad leather strap surrounding the thigh.

In 1760, Robinson, an able surgeon at Geneva, gave an account of Verduin's practice in the Royal Academy of Sciences, which, however, declined to pronounce any judgment about it, without further experience.

Though this method of amputation was adopted by de Couding, in a tract published at Amsterdam in 1760, it was afterward slightly extended by P. Marquet, an account of the operation with which Robinson failed, the society with which the flap served for the support of the lower extremity, and the avoidance of stiffness by the non-exposure of the bone. He also drew upon the economy of the stump, for the application of an artificial foot.—*De l'Amputation d'un membre*, 8vo. Paris, 1760. He also disapproved of the flap-operation, because it appeared to him that the irritation of the bone by the pressing instrument was in itself powerful inflammation; he pointed himself after the manner of Heister, and was strongly in favor of the use of ligatures.

Some excellent prospects were delivered by J. L. Petit concerning amputation. He expressed the disapproval, and instead of the flap-proposed amputation knife formerly employed, first because (who use the straight instrument) cannot know with sharp knives, how soon the ends of the bone separate, because such bones are cut, and are exposed to the air, and the rest of the body. He proved that making the

dissect in the superficial parts was frequently followed by hemorrhage; and for the suppression of bleeding he thought it the best principle to promote the formation of a coagulum.—*Opus de l'Art de la Chirurgie*, an 1750, p. 100. See Hemorrhage. For compressing the vessels, he employed an instrument which covered the stump like Vesalius's retentorium, and made pressure by means of a screw. The only objection to Verduin's method was, that the extension of pressure to the bone frequently induced the formation of so huge a flap. He laid down the suitable general manner of always removing as much bone, and as little flesh, as possible; he which purpose, he intended what he termed the double incision, or dividing the thickness of the stump through the soft parts into two stumps. About an inch higher than the place where he meant to saw through the bones, he first made the superior cut through the integuments down to the tendons; the flap was then pulled up as in lesser the flesh corresponded to the extent of an inch, and the saw was then now divided at the highest point of that extremity. Lastly, the flesh was left out of the way with a scissor, and the bone was sawed through high enough up to allow of its extremity being well covered with flesh and integuments. The greatest defect in the doctrine of Petit, relative to amputation, was the condition he put in practice, instead of the ligature.—*Yeast des Malades*, Chap. vol. 2, p. 100. The first performance of amputation at the shoulder-joint, by de Prost, and the improvements and alterations of that operation suggested by Goussier, de la Faye, Desault, &c. I shall notice in a future series.

In chronological order, the next most celebrated method is the history of amputation, was the promulgation of an opinion by T. H. Goussier, that Verduin's flap-operation might be turned back to times of great antiquity, the method described by Celsus being very similar.—*Histor. Med. Chap. vol. 6, p. 181*. On this point, with reference to Lousiana, the true inventor of the flap-operation, I have already delivered my own sentiments.

The flap-operation of the leg, after Verduin's manner, was tried by de la Faye, who found that the pressure of the flap was not strong to check bleeding from the vessels, as it only operated on the anterior tibial artery, and by pressing the bone more firmly against the rest of the bones, he thought was risk of mortification threat to be commenced.

Verduin and Robinson, as we have seen, made only one flap. Two French surgeons, Ravaton and Verduin, afterward thought that it would be better to have a flap from each side of the limb. They were also advocates for tying the vessels, and ligging the two flaps also closed, so as to prevent their speedy union, and further suppurations and profuse suppuration.

However, there is some difference in their methods of forming the flaps. Ravaton, who suggested the plan to the French Academy in 1726, made three deep incisions down to the bone; first, a circular one, with a crooked knife, within four finger-breadths of the bone intended to be removed; and then with a somewhat larger knife, the two little perpendicular ones at the first, one at the first part, and the other at the back of the thigh; and, having care not to touch the principal vessels, he detached the two flaps from the bone.

Verduin formed the superior flaps in two incisions. After applying the saw, you he extended the part with two roll thumbs, at the distance of one finger-breadth from each other, was in the bones where the bone was to be divided, the other on the side where the thickness of the flaps were to be formed. He then drew almost a four-finger-width of the bone, as the first part of the flaps, and it must be noted the circumstance, so that it might come out at the opposite part; then, directing the edge of the knife along the bone, he saw down to the superior third, where he separated the first flap, which, as the author says, makes a round or conical figure at its extremity. The second flap was made in a similar way on the inferior side of the bone.—*Trattato del Furore d'Armen*, 4. two par. Ravaton, 8vo. Paris, 1726. De la Faye, in 1734, de l'Art de l'Art, 1. 1. 2. ed. 1734. Verduin, *His. de Chir. 8vo. Marseille*, 1757.

In presence of M. Quinquy, Garagaud performed the flap-operation according to the method of Verduin and Desault. We know that they made no operation on the vessels, and that their intention was, that the

flap, when applied to the stump, and sustained by a protruding apparatus, should evince antiseptic healing.

Garrigue's patient died on the third day after the operation; hæmorrhage having had a considerable share in producing death.

The simplicity of machines described by Verbiest, La Foye, &c. had no other guiding than of keeping the flap near the surface of the vessels, so as to compress and close them. In consequence of the difficulty of making this compression previously required, the most considerable hæmorrhage occurred between the two flaps, and when cut, generally hæmorrhage retarded, Garrigue decreased in desire to employ ligatures.

With these views, two years after the foregoing case, Garrigue performed a flap-operation on the arm, preserving two flaps, according to the method recommended to the Academy by Roux. The brachial artery was tied, and the patient was cured, without any embarrassment.

Garrigue made a third trial of this operation on a soldier dangerously wounded in the right foot by the trampling of a horse, which fractured the upper part of the two bones of the leg, and several of the toes: the patient recovered in fifteen or twenty days.

In this operation the single flap was made. Garrigue was fatal, however, that the single flap might create some difficulty in maintaining the ligatures, and he therefore took a review of ligatures, and where they were situated; but of this objectionable plan I shall not speak. He rightly performed dressing and bandaging the stump to the use of the compressing machines devised by Verbiest and La Foye; and his choice of a straight knife, instead of a hooked one, was equally judicious.

The preceding case dictated a truth, which will last as long as surgery survives, that it is advantageous to apply the ligatures in such manner as to produce as more than the result, so that they may fall off the wound, and the parts move quickly into.—M. de Garrigue, in *Mémoires de l'Académie de Chir.* t. 3, p. 136m.

At one time, an objection frequently made against the foregoing method was, that when the foot cut off was immediately laid over the stump, inflammation and abscesses were apt to occur. Roux, in 1765, Dr. Hunter O'Halloran, a surgeon at Limerick, was led to make the experiment of detaching laying down the flap till the end of the ten or twelve days after the operation, when it was conjectured that the risk of inflammation and abscesses would be decreased. The result of O'Halloran's book is apparently corroborated by the facts brought forward. Here we see one of the grand plans, raised upon by one worthy countryman, James Young, viz. the choice of an amputation of the wound from laying down the flap without delay, whereby it grows up, and because the wound could not always be healed without separation, it was determined that it never should do so. However, it is unnecessary to say, that O'Halloran's suggestions were given only in the theory, and not in the practice of surgery.

Alexander Morris, senior, was an open opponent of various methods which originated among the French surgeons, and, as you are clear, he disapproved of the compression; he secured the vessels with ladders and ligatures, and was the inventor of a machine, which has been extensively applied under the name of Morris's roller.—*Medical Essays of Edinburgh*, vol. 1, p. 337.

Goodell, like La Foye, retained amputation as a first choice, and he did not amputate, as previously, as shortly as possible, in every case of gunshot, much less in every instance of a cold cutting or virus. From a passage quoted I have just from Dr. Boon's *Cyclopædia*, it would seem that this mode was known to the ancients; yet, according to general opinion, and I cannot give than it is incorrect from any passage in the *Præceptorum*, it is recorded as being in the first instance, which was employed this very useful instrument.—*Ann. Chir. et Obs.* vol. 1, p. 411, 5th Ed. 1774.

About the year 1778, the removal of limbs without bloodletting was a subject of good deal trouble. A single case recorded by Séguin, which, when mortified, was removed without hæmorrhage, was the foundation of the scheme. The arteries were completely tied up, and the parts removed.—(*Fluxus*, *Med. Chir.* vol. 3, p. 165.) A similar occurrence was related by Akerl (*Ann. Medica*, p. 337); and Labatier proposed himself a believer in the necessity of bloodletting

stage, on account of the vessels being filled with coagula, and therefore he also proposed of tying and tying the vessels, or rather tied off, without bloodletting.—(*Fluxus*, *Med. Chir.* vol. 3, p. 272.)

In cases where the preceding basis of the stump was affected with necrosis, Bismar, an experienced military surgeon, visited to describe a second time, and urged a variety of operations in defence of the principle.—*Mém. de l'Académie de Chir.* t. 2, p. 254. He associated with Le Boon and Bismar, however, about the propriety of restricting amputation to very cases, and has stated numerous examples of limbs being saved, which, according to the doctrine then in vogue, would have been cut off.—(*Revue Médicale de Chir.* de l'Académie, Paris, 1786.)

M. Louis, a French surgeon of extraordinary talents, introduced the plan of dividing the loose muscles first, and tying those which are closely connected with the bone. He showed that the muscles of the thigh, after being divided, were retracted to an unusual degree. He observed that the superficial ones retracted along the tract, more or less obliquely, without being attached to the bone, were drawn up with greater force, and to a greater degree than others, which are deeply seated, in some instances, parallel to the axis of the femur, and draw to this line throughout their whole length. The situation begins, the very instant when the muscles are cut, and is not completed till a short time has elapsed. Hence, the effect should be prompt, and be as perfect as possible, before the bones moved. In the amputation of the thigh, Mr. Louis was always desirous of letting the muscles contract as far as they could, and for this reason he was rather averse to using the tourniquet, as the greater pressure of this instrument in some measure counteracted what he wished to take place; and hence, at one time he preferred letting an assistant make pressure on the artery, though he subsequently expressed his approbation of the tourniquet proposed by M. Eschsch for compressing the femoral artery.—*Mém. de l'Académie de Chir.* vol. 1, p. 60, 61.

Animated by such principles, Louis reached a kind of double process, different from that of Hunter and Pott, and different also from Almon's method, which I shall hereafter name. By the first stroke he cut, at the same time, both the integuments and the loose superficial muscles; by the second, he divided those muscles which are deep and closely connected to the bone. On the first deep circular cut being completed, Louis used to remove a band which was placed round the limb, above the track of the knife. This was taken off in order to allow the divided muscles to become retracted without any impediment. He next cut the deep adherent muscles on a level with the surface of the bone, which had been divided in the first incision, and which had now attained their utmost state of contraction. In this way he could evidently see the bone very high up, and the perfect division of the skin from the muscles was avoided. Louis was conscious that there was more necessity for seeing inside than skin; and he knew that when an incision was made at once down to the bone, the retraction of the divided muscles always left the edges of the skin projecting a considerable way beyond them. Hence he derived the plan of first seeing a portion of skin by dividing it from the muscles and turning it up, quite unnecessary. As the bone should always be viewed rather higher than the division of the soft parts, Louis, like J. L. Pott, and most other judicious surgeons, highly approved of the employment of a tourniquet. He was likewise the author of some valuable instructions for preventing the pressure of the bone after the operation.—(*Ann. Médec. de l'Académie de Chir.* t. 2, p. 258—410, 411.) The important reader, who takes an interest in reading the remarks on amputation published by this greatest of all the French surgeons of the last century, with the exception perhaps of J. L. Pott and Bismar, will be interested at once with the force and perspicuity of his language, and with the correct propriety of a good deal of the practice he has laid down.

In England, Cheselden, and not J. L. Pott, is regarded as the surgeon who revised Hunter's method, by proposing to divide the soft parts by a double incision, that is, by cutting the skin and dividing the muscles first, and then, by dividing the muscles down to the bone, as a last with the edge of the bone, so that the bone might be saved higher up, and its end as more com-

ply covered with skin. Whether Cheselden had the priority in this improvement, I cannot presume to say; but it is rare as a record if it is Gaillier's, introduced by Duret's thesis on the operation, as early as 1783, which was long prior to the appearance of Pott's posthumous writings; and Mr. Cheselden further remarks, that during his apprenticeship to Mr. Fenn he had communicated to that gentleman his sentiments about the double incision.

It is only to render the flaps free, avoiding a pyramidal or star-shaped shape, which sometimes happened notwithstanding every improvement or talismanic incision; a circular bandage was employed, which acted by supporting the skin and muscles, and preventing their retraction. This bandage, when properly applied, from the upper part of the limb descended, fulfilled in 4 or 5 turns, sometimes the roll proposed, though quite strong yet carried out very lightly. Mr. Sharp was indebted, therefore, to reserve the ancient plan of bringing the edges of the skin together with sutures; but the pain and other inconveniences of this method were such, that it was never extensively adopted, and Mr. Sharp himself abandoned it. The same bandage, however, which he used to put over the end of the artery, remains in fashion even at the present day.—(Treatise on the Oper. p. 216. Clinical Inquiry, p. 268.) It is to be regretted that an excellent modern surgeon, the late Mr. Day, should have contemned so much as he had done the use of sutures, in bringing together the edges of the wound after amputation.—(Practical Observations on Surgery, p. 284, edit. 2.)

In opposition to Lenoir, the insufficiency of his method for preventing the protrusion of the bone was asserted by Valentin, who thought the wound ought to be left exposed by dividing the parts while they were in a state of tension; for which purpose he recommended changing the position of the limb, according to the parts which he was about to cut.—(Recherches Critiques sur la Chirurgie Moderne, 2^e An. 1778.) Valentin's proposal seems never to have made much impression on the profession; whether on account of its inconvenience or inefficiency, I know not, certain it is, least cases present themselves, in which the position of a limb absolutely cannot be changed during the operation, owing to the nature of the disease, or cannot be altered without extreme agony.

At this period arose the celebrated controversy about the propriety of amputation in general. As Sympson remarks, several French surgeons now began to be cautious, with De Bist and Biquet, that the operation was crueler on the sight, grovelling, and in particular that many had complained of tenderness might be cured without amputation. Such was the doctrine of Boucher (Mémoires de l'Académie de Chir. t. 2, p. 284). Germain (Anfangsgr. der Wundkunst, 8vo. Götting. 1755), and Pott—*Memoires sur les amputations* de Pott de l'Ac. de Chir. vol. 1, p. 230. The latter especially argued the production of delay in gun-shot wounds, and commented severely on the losses. But the writer who at this time made the most noise in the world by his general condemnation of amputation, was Bagnard (Mémoires de Médecine Amputatoire, 8vo. Paris, 1781), whose sentiments received a complete refutation from his own contemporaries. Pott (Chir. Works, vol. 2, Mémoire d'opérations de Chir. t. 1, p. 221), and de La Martinière (Mémoires de l'Académie de Chir. vol. 8, p. 1), and also three later writers, in whose reference will be made in speaking of Gun-shot Wounds. Even Bagnard himself was compelled to admit the necessity of amputation in cases of gangrene.—*Annales des Sciences Médicales*, 8, 178.

Bagnard's collector, the celebrated Schenckler, inclined to the same doctrine, and has detailed several cases, where limbs were not only shattered, but actually carried away by balls; yet where a cure followed without amputation. One of his maxims was, that it was better for the member to be taken off by gun-shot than by the surgeon's knife, as the ball opened on a healthy subject, and the knife on a person debilitated by an hospital.—*Chir. Works*, 3^e édit. 1, p. 203. In a little volume ready on this subject, he contradicted himself by shattered limbs without any gangrene. His mode of operating was that of M. Lenoir. He described post-operation on the hip and shoulder; but recommended those of the knee and elbow as better amputating.—(Voyage Schenckler, 3^e édit. 1, p. 2.)

Soon after the middle of the last century, the prac-

tice of amputating at the joints began to excite increased attention; but as this is a topic to which I must presently return, it is unnecessary now to dwell upon it. The writings of Pott, Wodan, Wodan, Bransler, Bismet, Sauter, Park, Moreau, and Vespaucière, in relation to this subject, deserve particular notice.

I now come to Mr. Alanson, whose name is an conspicuous in the history of amputation, as that of any surgeon yet mentioned. His chief objects were to hinder a protrusion of the bone, and to promote union by the first intention. He rejected the band which was formerly put round the limb for the guidance of the knife, as it interfered with the action of the muscles, and the contraction of the circular incision through the skin. When the ligament had been applied, an assistant grasped the amputations with both hands, and drew them and the bones directly upwards. The operator then fixed his eye upon the proper part where he was to begin the incision, which was made with considerable facility and dispatch, the knife moving with greater quickness in consequence of the loose state of the integuments.

After the incision through the skin had been made, the assistant still continued a steady support of the parts, while Mr. Alanson separated the cellular and ligamentous attachments with the point of his knife till so much skin had been drawn up as would, with the muscles divided in the particular way he desired recommended, fully cover the whole surface of the wound. Thus, instead of applying the knife close to the edge of the integuments, and dividing the muscles in a circular perpendicular manner down to the bone, Mr. Alanson proceeded as follows: when standing upon the thigh, and standing on the outside of the limb, he applied the edge of his knife under the edge of the supported integuments, upon the inner margin of the various internal vessels, and cut obliquely through them and the adjacent muscles upwards as to the limb, and down to the bone, so as to lay it bare about three or four finger-breadths before then it was usually done by the common perpendicular circular incision. He then drew the knife towards himself, then keeping its point upon the bone, and the edge in the same oblique line already pointed out for the former incision, he divided the rest of the incision in the same direction as round the limb; the point of the knife being in contact with and revolving round the bone through the whole of the dissection.

According to Mr. Alanson, the speedy cessation of the above-directed incision will be much expedited by one assistant continuing a firm and steady elevation of the parts, and another taking care to keep the skin from being wounded as the knife goes through the muscles, at the outer part of the limb. Mr. Alanson cures the old method of depriving the bone of its periosteum to a considerable extent above and below the part where the saw was to pass, not only as creating unnecessary delay, but, since the periosteum serves to support the vessels in their passage to the bone, as apt to produce exsanguination above the part where the bone is to be divided with the saw. Instead of this practice he recommended first the application of the retracter, as advised by Cooper and Hennenrich; and then dividing the bone at the part where the saw is to pass, whereby the bone may be sawed off faster than is usually practised; a material object for hindering a protrusion of the bone and forming a sound cicatrix.

If the flesh of a stump formed in the thigh agreeably to the foregoing plan, he gently brought forwards after the operation, and the surface of the wound as then viewed, it may be said to resemble in some degree a radial cleft, the apex of which is in the extremity of the bone; and the parts thus divided Mr. Alanson thought the best calculated to prevent a singular stump.

The part where the bone is to be laid bare, whether two, three, or four finger-breadths higher than the edge of the retracted integuments; or, in other words, the quantity of muscular substance to be taken out is making the double incision, must be regulated by considering the length of the limb, and the quantity of skin that has been previously moved by dividing the circumference attachments. The quantity of skin saved, and retractor suitable taken out, must be in such exact proportion to each other, that the whole surface of the wound will afterward be easily covered, and the limb not more shortened than is necessary to elude the saw.

After the removal of the limb, Mr. Alanson drew each

bleeding every artery cut with the same force, and tied it as tightly as possible with a common slender ligature. When the large vessels had been tied, the torn edges were immediately slackened, and the wound well cleaned, in order to expose any vessel that might otherwise have remained concealed with its orifice blocked up with coagulated blood; and before the wound was divided, its whole surface was smeared with the greatest quantity of lint, by which means Mr. Alcock frequently observed a pulsation where the hæmorrhage previously appeared, and turned out a small clot of blood from within the orifice of a considerable artery. He is very particular in recommending every vessel to be secured that is likely to bleed in the attack of the sympathetic fever; for, besides the fatigue and pain to which such an accident immediately exposes the patient, it seriously obstructs the desired union of the wound. He used always to dress the whole surface of the wound with a sponge and warm water, as he thought that the lubricity of any coagulated blood would be a considerable obstruction to the quick union of the parts.

The skin and muscles were now partly brought together; a flannel roller was put around the body, and several towels or three pieces of flannel were placed over the upper part of the thigh, so as to form a firm support to the limb, when the Alcock called a sufficient bandage, which he usually added to the support of the skin and muscles. The roller was then continued down in a circular direction to the extremity of the stump, not so tight as to press rudely on the skin, but so as to give an easy support to the parts.

The skin and muscles were now placed even the lower in such a direction that the wound appeared only as a line across the face of the stump, with the edges at each side, from which points the ligatures were left out, so that usually no other ligatures were given. The skin was gently secured in this position by long strips of linen by that of the breadth of about two fingers, spread with cotton or any cooling ointment. If the skin did not easily meet, stripes of melting plaster were pasted. These were applied from below upwards, across the face of the stump, and over them a soft tow-padded, and composed of linen, the whole being retained with the many-tailed bandage, and two tails placed perpendicularly, in order to retain the dressing upon the face of the stump.

Mr. Alcock continued the plan of raising the end of the stump far from the surface of the bed with pillows, so the patient usually reclined by it; and he considered it best to raise the stump only about half a finger's breadth from the surface of the bed, by which means the muscles were put in a more relaxed position. The many-tailed bandage Mr. Alcock found much more convenient than the wisp of cotton, especially used in former times to support the dressing; and he observes, that though this seems well calculated to answer that purpose, yet if it be not put on with particular care, the skin is liable to be drawn backwards from the face of the stump; nor can this would be found wrong, providing upon the stump is removed. (See Alcock's Pract. Diss. on Amputation, 8vo. Lond. 1774.)

The chief peculiarity of Alcock's method of operating, namely, the mode in which he recommended the incision of the muscles to be performed, did not, however, meet with universal approbation, and his extensive dissection of the skin from the muscles was considered as excessively painful. The formation of a correct wound by following Alcock's directions, was regarded by several as impracticable. (See Martin's Puerperia, &c. 1, s. 88; Loder's Surgery, &c. 1, s. 7; Wardlaw's, 8vo. 2d ed. 1815, p. 51; Ruy, Anatomie, vol. 7; Goussier, Nouveau, &c. p. 5; Ruy, Pract. Med.) In any system there can be no doubt of the truth of some of the criticisms made by these and some other writers on the impossibility of performing a wound with a regular circular cavity, by following the directions given by Alcock; for if the knife be turned round the number of half-circles required, certainly upwards towards the toes, it will pain greatly, and of course the end of the incision will be considerably higher than the beginning. But though Alcock probably never did himself exactly what he has stated, I am sure that his possession of making an oblique division of the muscles all round the member has been the source of great improvement in amputations in general, and is what is actually used in by all the best modern surgeons. It is true they do not actually per-

form the oblique incision all round the limb by one stroke or rotation of the knife round the bone, as Alcock says that he did; but they accomplish their purpose by repeated, distinct, and suitable applications of the edge of the instrument turned obliquely upwards towards the bone or bones.

Among others, Myer failed fast with some of Alcock's instructions, and thought every dissection might become equally attended by using skin enough, and then cutting through the tendons. The first incision, however, he directed obliquely upwards through the integuments, while they were drawn up by an assistant, and he then cut down to the bone. (Pract. Theoretique d'Amputation, 2vo. Bernay, 1783.) Several consider Myer's plan merely as a revival of Galien's method, as it had in view only the preservation of skin, and not the formation of a fleshy cushion. (Goussier, Nouveau, &c. 1, s. 105.)

Kirkland endeavored to improve Myer's plan by cutting off a piece of skin at each angle of the stump, so as to keep the integuments from being drawn into folds, and in opposition to him, he collected the writings of Hippocrates concerning the successful treatment of deep-seated sores without amputation. (On the present State of Surgery, p. 573, and Thoughts on Amputation, 8vo. Lond. 1798.)

B. Bell used to operate very much in the same way as Myer; and when it seemed advantageous to make a flap, he did not disapprove of the plan suggested by Ruyss, Vesalius, and Alcock. (Hist. of Surgery, &c.)

An interesting paper on amputation from some years ago published by Loder; its chief purport was to defend Alcock's method with some slight modifications. (Clar. and Medic. Biblioth. 1793, p. 59, 2vo. 1794.) However, the alterations suggested by Loder do not seem to Goussier at all adequate to the removal of the difficulties with which the mode of raising the flaps exactly after Alcock's directions is attended. (Nouveau Traité de l'Art. de l'Amputation, Goussier, p. 4, 4to. Bernay, 1812.)

The removal of flaps, without bloodless, proposed by Goussier at Calais in the 14th century, has met with warm adherents in J. Wiersebe and W. G. Ponsquet. J. Wiersebe, was a ligature, which was daily made tighter, took off an are above the elbow. In the disease he applied a styptic powder. On the fourth day, the flaps were removed down to the bone, which was secured with a cloth. (Goussier's essay, 8vo. Bernay, 1812.) Ponsquet thought the plan suited to excruciating rapid subjects, but he well adapted to the leg or forearm. (Von der Verringerung des Gliedes, 8vo. Gießen, 1798.)

Some other modes of doing flap-amputations, and in particular the suggestions and improvements made by Her, Chopart, Dupuytren, Larrey, Lisfranc, and other modern practitioners, will be noticed in the description of the amputation of particular members. In the mean time, I shall conclude this section with mentioning the feasible attempts made at different periods to render the patient less sensible of the agony produced by the removal of a limb.

Theodorus, as we have said, administered for this purpose opium and henbane, and though he was assisted by many of the ancient surgeons, few surgeons have denied the practice worthy of being continued. Goussier made the experiment of saturating the pain with a light opium; but a machine devised a few years ago in England expressly for the object of stupifying the nerves of a limb previously to amputation, is perhaps not undeserving of further consideration. (See J. Moore's Method of preventing an Amputation Pain in severe Operations of Surgery, 8vo. Lond. 1784.) The great reason of the latter plan being given up is, that even patients have made more complaint of the sufferings occasioned by the process of making the anæsthetic of the nerves than of the agony of amputation itself without any such expedient. Yet daily experience proves that the pressure caused on the sensitive nerve by sitting with the limb in a certain position, will completely destroy the feel and feel, and this with such an absence of pain, that the pressure applied is easily abstracted of the patient being asleep, as it is termed, used to this to walk. On the little good done by warming and flapping the stump, Lisfranc, a method once much recommended (I read and heard after the Amputation of the Osella and the Warner, p. 3-25, Leipzig, 1806), I am sure it is unnecessary for me to comment.

AMPUTATION OF THE THIGH.

The thigh might always be amputated so low as the disease will allow, so that as little of the bone may be cut off as possible, the pain may not be greater than necessary, and the section of the wound have not so great an extent as would otherwise happen.—(Lancet, Med. Obs. p. 256, t. 3, ed. 1.) The patient is to be placed on a firm table, with his back properly supported by pillows and assistants, who are also to hold the limbs, and keep him from turning too much during the operation. The side of the sound limb is to be fixed by means of a strong band, or rather to the distal leg of the table.

Then, however, through an imprudent mistake to obtain the above advantages, let the surgeon ever be successful of the great action as stopped operations, that all the diseased parts should be removed, but it is to be a result of the truth of what I have said, that it is more reasonable to cut away too much than too little.—(Norton, in the *Advancing practitioner*, p. 50.) At the same time, I do not agree with some modern writers, who deem it necessary to separate beyond the limits of every abscess and tumor, which may not only be far above a diseased joint of diseased fracture. Many of these operations are only like ordinary abscesses, and do not go well after the main disease or injury is removed, as I have often seen. Where it is a reasonable rule to cut off a limb above every reflection of swelling, sometimes two or six inches above of the thigh would be sufficient, thus, circumstances immediately demands, and the greater distance of a limb than a less operation would be considered. However, in all cases where the bone is supposed to be removed, or the muscles are affected with the vascular changes peculiar to hyperæmia or disease of the circulation, the operation should be performed sufficiently high to take away all the diseased parts. In extraordinary operations, where there has been much suppuration in the limb, and a crisis runs up, Mr. Guthrie says, that if the tubes extend only a short way between the muscles, the wound being it may be divided with; but if the matter has been upon the bone, then will have to open the bone, and amputation should be done high enough to remove the affected part of it.—(The *Lancet*, Wounds, p. 62.)

Many writers disapprove of amputating too close to the knee (Guthrie, Op. p. 60; and Langenbeck upon one objection to it not specified by us) other author, viz. that if the operation be done lower down than two inches higher above the knee, the femoral artery strikes the aponeurotic sheath, which it here receives from the brachio-vascular and thoracic, and cannot be drawn out with the forceps, so as to be securely tied, without first slitting up the sheath. Hence, he recommends cutting through the muscles at the distance above the knee already mentioned.—(Ed. *Med. Clar.* t. 1, p. 571, 2nd. Ed. 1850.) But when I come to look at the breadth of two adult hands, and see how thick of the limb would be situated at all points, only to see a little muscle, I cannot bring my mind to concur with Langenbeck—the artery being more than the sheath cut.

The next thing is the application of the tourniquet.—(See *Tourniquet*.) The pad should be placed exactly over the femoral artery in its bed, a cushion as low as conveniently done. When the thigh is to be amputated high up, it is better to let an assistant compress the femoral artery in the groin with my compound instrument, furnished with a round elastic cord, calculated for making direct pressure on the vessel without injuring the surrounding parts. Some authors would give a strong preference to this method, whereas the thigh is amputated high up or low down.—(Guthrie, *Principles of Med.* p. 155. Brown, *Principles of Med.* p. 256. See also *Langenbeck's Op.* in *Ed. Med. and Surg. Journal*, 20, p. 43.) Were the patient, however, in a delirious state, and unable to bear loss of blood, or pain, or in this way, or some considerable bleeding, by means of the compression with the instrument of the internal dissection, I should feel disposed to employ the tourniquet. Alas! however, circumstances would admit of its application. In instances of the thigh, the great objection to the use of the instrument is, that it impedes the flow and impedes the return of the same arteries after they have been cut; the consequence of which is, that the surgeon cannot make so high an in-

ter-vascular could do the Cooper's method which are more fixed and attached to the bone. Yet in order to have the same well carried with force, and no danger of a sugar-loaf stump, the latter object is one of the importance. Perhaps the best general rule is to attempt the application of the tourniquet in amputations done as high as the middle of the thigh, except where the patient is exceedingly weak, so that he cannot bear the smallest loss of blood, and no strong intelligent assistant is at hand, to whom the compression of the artery in the groin can be judiciously confined. When, however, the operation is to be done much higher up, or where the employment of a tourniquet is wisely avoidable.

Whether the right or left thigh is to be removed, it is customary for the operator to stand on the patient's right side. The great advantage of this position seems to be, that the surgeon's left hand can be then more conveniently and quickly brought into use than if he were obliged to stand on the same side as the part he is about to amputate. This seems to be directly assignable reason for this habit; for when the left thigh is to be amputated, it is certainly more inconvenient to have the right hand between the operator and the foot, than it is to be removed. But this is found true in most cases not having the left hand near the wound.

Mr. Guthrie, in speaking of amputations on the two lower thirds of the thigh, observes, that "in these cases the tourniquet should be used," but in operations high up the thigh, he joins all other surgeons in recommending the internal artery to be compressed against the os pubis.—(See *Ed. Med. and Surg. Journal*, p. 152.) The utility of slackening the tourniquet completely, however, as soon as the principal vessels are severed, a piece of advice delivered by this excellent surgeon, I perceive, enters to right on the position which he specifies, viz. the impediment made by the strap of the instrument to the rotation of the muscles, and the consequent difficulty in such operations of turning the bone, because in common practice the bone is always moved before any of the vessels are secured; and loosening the tourniquet entirely, when any arterial branches still require the ligature, must certainly be objectionable, if loss of blood be a disadvantage. In these operations high up the limb, indeed, where the arteries are sometimes tied, before the division of the bone, the employment of a tourniquet at all is quite out of the question.

We know that it was my opinion of the late Mr. J. Bell, that the first of blood through a large artery could not be completely stopped by pressure; and the late Mr. Hey adopted a similar notion, in consequence of seeing a case in which the operation of two tourniquets in the thigh did not restrain the hemorrhage from a fungus hæmorrhoides of the limb. He says, the pressure of the tourniquet does not completely obstruct the passage of blood in the arteries; it only diminishes so much of the force of the current as to enable the vessels, in a second stage, to resist their natural contractile power so effectively as to prevent hemorrhage.—(See *Hey's Pract. Obs.* p. 157, 158, ed. 2.) Of the uncertainty of this doctrine no man can doubt, who sees the femoral artery with its open mouth on the face of a stump not bleeding, while the tourniquet is tight, or should pressure be kept up, but throwing out the blood to a great distance the instant the pressure is discontinued. Nor, I suppose, can any surgeon, who has attended to the circulation, and seen how completely pressure overflows the flow of blood through the spirit-stemmed artery-artery, just in the situation of John Bell and Hey take any particular pause. Here I can speak with confidence, because I have myself attended at the amputation, and assisted at this operation several times, and feared the consequences of the preceding writers partially and almost completely. Were any further testimony required, I might cite that of Dr. Hunter, who remarks, among other things, that in a suppurated case, operation upon by Mr. Pott, the vessel of blood cut from the principal artery was so much that the quantity contained between the point of pressure and the point of incision, through the vessel.—(*Principles of Military Surgery*, p. 157, ed. 2.) The same has happened twice in the example, where I actually opened the blood in a press pressure.

Mr. Hunter, in talking of the pressure, the preceding instance, observing that pressure suggests nothing but only to stop the pulsation of an artery in a limb,

but also to arrest completely the flow of blood, can be easily applied by pressure of the fingers only. And, in order to prove the correctness of this remark, he has occasionally, when on going about with him at hand, compressed both the femoral and iliacal arteries with the fingers of one hand, while with the other hand he has saved the limb, and this, as he affirms, with the arm or even less than that of his hand (followed the artificial mode). His constant pressure, however, is so in the pressure to be made by an assistant, and to employ an instrument.—See Ed. Med. and Surg. Journ. vol. 55, p. 351.

If, then, the flow of blood through an artery can easily be controlled by pressure, how can we so explain the occasional occurrence of bleeding notwithstanding the pressure of one, or even two, tourniquets? Without doubt, by the fact that the parts of these instruments, when not duly arranged, do more harm than good, by raising the level of the vessel, and perhaps also, in Mr. Day's conception, by the additional compression, that increases of the fragile blood-vessels and include a large quantity of blood, and with blood pressure, and for a considerable time, after the main supply of blood to them is cut off. The same thing happens in the disease called aneurism by anastomosis, as I have had several opportunities of witnessing, but in aneurism there is always that in the vessel, when some time after Mr. Hodgson had told the story, and after articles, Mr. Lawrence divided away part of the finger, exposing the artery and bone, and yet a considerable bleeding went on from the farther side of the wound.—(See Med. Chir. Trans. vol. 9, p. 216.)

The application of the tourniquet is generally left too much to assistants; but, as far as my judgment extends, no operator is justified in commencing the operation before he has examined, and fully satisfied himself that the tourniquet is correctly applied. Mr. Guthrie correctly tells us that he never lost an artery, in consequence of hemorrhage during the operation, although the tourniquet was in the charge of a surgeon of ability; and the advice with which he follows this statement is worth recording: "In a case of this kind, where if the tourniquet is raised at all too soon, the surgeon should not continue twisting and turning it, while the patient is bleeding, but cut it altogether, and compress the artery against the bone." This remark, I think, cannot be too highly commended.

The shape and size of the part of the tourniquet employed are of importance. At St. Bartholomew's, the pads employed are very firm, being composed of wood, or cork covered with leather, and rather thicker than the thumb, the upper surface being flat, and the lower, which is put under the thigh, being convex. They are about as thick and a half an inch long. A dark pale-ash-wood extremely well, as I can attest from the observation of some hundreds of amputations in that hospital. A convex form firmly was the regular form of pads which were too large and soft, and not palmately shaped. As Mr. C. Bartholomew remarks, the principal objection is a large pad, that the bottom of the tourniquet is so much raised by it, that a considerable space is left on each side of it, where an compression is made on the limb, however closely the tourniquet may be applied, and that there will be a risk of hemorrhage from such vessels as happen to be in these situations. The same gentleman also is of opinion it is not better than a finger, and gives it simply over the artery, so as to prevent the possibility of dislocation.—(Pract. Obs. in Surgery, p. 11—12.) Mr. Hildreth says, "The pad should be first and rather square, and steadily kept steady over the artery, while the ends of the bandage in which it is contained, are placed on the limb. The strap of the tourniquet is then to be put round the limb, the instrument being brought directly over the pad, thus the artery is free. The strap is then to be drawn tight, and buckled on the outside, with a pressure to griping, and not interfere with the artery, which is to be turned out, and pressure is sufficiently furnished over the circulation. If the artery is to be turned out, the strap is not sufficiently tight, if the pad has not been well applied, and they must be repeated."—The Glasgow Wounds, p. 204.

In two amputations at St. Bartholomew's Hospital, I saw the tourniquet with its pads and parts had been washed, and as the case of these was a good deal of

blood was lost, because another tourniquet happened not to be in the room, and pressure on the artery in the groin was not immediately adopted. I coincide with such writers as recommended the rule of always having two tourniquets ready. Guthrie even goes so far as to advise putting both of them round the limb before the operation commences. Nor does the Abbé's primary tourniquet, p. 58, cut the frequency of a tourniquet breaking is not so great. However, as I demand wide pressure, and the plan would be very objectionable in large amputations, where it is a material advantage to have plenty of room between the place of the incision and the band which goes round the limb.

An assistant, after grasping the thigh with both hands, is to draw up the skin and muscles, while the surgeon, beginning with that part of the edge of the limb which is towards the femur, makes a circular incision as quickly as possible, through the integuments down to the fascia, on, as Mr. Guthrie and Dr. Hennen recommend, even completely through it. According to Mr. Guthrie, the skin cannot be sufficiently removed, unless the fascia be divided, which he appears to think ought rather to be drawn up with the integuments than dissected from them.—(On Gunshot Wounds, p. 235. Also Hennen's Military Surgery, p. 202.) On the contrary, Professor Larnach is very particular in exposing the artery to avoid cutting through the fascia by the first sweep of the knife, because he holds that the arteries are better held together, and can be more regularly divided, by cutting them and the fascia at the same time.—Ed. for the Chir. b. 1, p. 551.

Nor does M. Roux divide the fascia by the first sweep.—(Note, see in Spanish immediate de la mano apply Amputation circulaire, p. 3, Bro. Paris 1814.) At St. Bartholomew's, the surgeon rarely or never cut through the fascia with the integuments, but saw at carrying the knife perfectly down to it all round the limb. This, of course, could be done without fear of doing rather more; for, as Guthrie observes, if the outer layers of the muscle be torn and there a little tension, this causes less pain than the additional strokes of the knife for dividing any portion of the skin and cellular substance not completely cut through in the first instance. Guthrie also dissent from Myerson and others, who are advocates for cutting the skin obliquely instead of perpendicularly, because he holds the first edge of the integuments thus separated from the subjacent cellular membrane, very apt to slough.—Nor does the AM. Grosser's (Glasgow, p. 101.) At a slight ordinary amputation, the first incision should be made four inches below where it is intended to saw the bone. When the thigh is left, the large amputation knife will be found the best. Before beginning this first cut, the arm is to be carried under the limb, till the knife reaches almost round to the side on which the operation stands. With one sweep penetrating at least to the bone, the knife is then to be brought round to the point where it first touched the skin. Thus, the wound is more likely to be regularly made, than by cutting first on one side, and then on the other, while the patient is under some degree of pain, in consequence of the interrupted quivering with which the incision is made. At the same time, I ought to remark, that the late Sir C. Bland, and some other surgeons, whom I have never known, used to complete the circle by two strokes of the knife as well and expeditiously, that their constant attachment to this plan could hardly be traced fault with.

The next object is the preservation of as much skin as will afterwards, comply with the incision, cut in an oblique direction, nearly the end of the stump with the utmost facility. It is rather difficult to lay down any other general principles for the guidance of the surgeon in making amputations. I am disposed to agree with several modern writers, that the painful dissection of the skin with the incision has been overestimated and promised to a very unnecessary extent, that is to say, unnecessary if the division of the muscles be performed in the most advantageous manner. Guthrie, one of the best surgeons at Paris, does not dissect the skin from the muscles as he is separating the thigh, but takes care, after making the necessary incision, to leave the integuments and subjacent flesh very freely drawn up before commencing the dissection of the muscles. This instruction is also strongly advised to be done uniformly and steadily, as noted

the member, but in dividing the muscles any irregular projection of the skin interferes with the regularity of the incision of the bone.—(Northern Brit. Med. Assoc. Transactions, p. 103.) Instead of dissecting back the skin, Desjardins cuts all the old parts at once in the bone, which he real reserves, after retracing the muscles.—*Synopsis*, in *Edinb. Med. and Surg. Journal*, vol. 14, p. 202. However, Langenbeck, another of the most skilled operators on the continent, professes dividing the integuments from the fascia by about two diagonal incisions (Edinb. Med. and Surg. Journal, 1855, p. 561), as is perhaps the most common practice in the London hospitals. Some late writers, particularly Mr. Byrne, in expressing their preference for incision as a means for the end of the bone, seem to forget one fact which I have often noticed, viz. that the muscular cushion, though at first thick and good, soon settles to a comparatively level state.—This is common in a general way in the animal economy, prevailing whenever the natural action of a surface is lost or prevented. So Audley Cooper states, that the covering for the end of the bone made by integuments and not vessels; for if vessels were preserved with the integuments they will contract, and retraction of the skin covering the stump will be the result.—*Lancet*, vol. 1, p. 144. Desjardins also thinks skin a better and more durable covering for the end of the bone than muscular fibres, which after a time become scarce; and hence he compares the quantity of integuments which ought to be saved, by the measure of the circumference and diameter of the member. Thus, when the limb is nine inches in its circumference, the diameter is seven inches; therefore, two inches and a half of skin on each side is to be saved.—*Edinb. Med. and Surg. Journal*, p. 75. But this author cuts the muscles perpendicularly, so that the bone is left to separate much more skin from the flesh than is necessary when the incision through the integuments is carried obliquely upwards. Mr. Hey's method of calculation, which I shall presently notice, appears more adapted to ordinary practice; and he says, "the division of the posterior muscle may be begun at half an inch, and that of the anterior at three quarters, above the place where the integuments were divided."—(Pract. Obs. in Surgery, p. 525, ed. 5.) With the view of preventing the necessity of dissecting the skin from the fascia, Mr. Galtius, as already noticed, surrounds the place of cutting through the fascia, together with the integuments, by the first stroke of the knife, and retracting these parts in the same way, instead of dissecting them free with a scalpel. If this method be found perfectly efficient, and it is not objectionable, as expressing the opinion to be cut unecessarily, I think the reason specified against it by Langenbeck, and explained in a preceding page, not strongly enough to form a just ground for rejecting a procedure which comes with the almost advantage of preventing the necessity for all painful dissection of the skin from the muscles. However, in secondary operations of the thigh, if the integuments be unscathed and will not retract, Mr. Galtius appears of their being dissected back to an equal distance all round.—(On Gun-shot Wounds, p. 205—206.) Dr. Bennett, by giving an oblique direction to all the incisions through the muscles, diminishes the necessity for much dissection of the integuments, and he says that in a small limb he has repeatedly performed the operation with oversight of the knife, cutting obliquely upwards and upwards at right angles to the bone.—*Principles of Military Surgery*, p. 250, ed. 2. The writer, like Mr. Galtius, also recommends carrying the knife through the fascia in the first circular incision; and so does Mr. C. Buzhasson, who makes no mention of dissecting back the skin, but simply states, that the "integuments and fascia being divided by a circular incision, and retracted upwards as high as is judged necessary, the superficial muscles should next be divided."—*Ann.—Pract. Obs. in Surgery*, p. 21, Nov. 1855. We are therefore so positive, that the joint Galtius and others is, dividing the separation of the skin from the fascia unecessarily. My own observations in practice lead me to believe, that the dissection of the integuments from the subjacent parts need formerly to be carried to an extent beyond all reasonable necessity, and that, as it has now passed, proceeding, and finally by leaving a large loose pocket for the judgment of nature, it ought to be abandoned by every surgeon, who follows the method of carrying the bone considerably higher than the first cut through

the superficial vessels. I am not, however, prepared to assert, that no one has or all is generally disposed to, but my mind is disposed to follow the procedure adopted by Mr. Hey, as recommended by Mr. Hey, the great advocate. This gentleman, who Desjardins (Edinb. Med. and Surg. Journal, 1855, p. 561), is an advocate for operating with a single incision, and for preserving such a quantity of muscular flesh and integuments as are proportionate to the diameter of the limb. By a single incision, he means first an incision through the integuments above; secondly, an incision through all the muscles, made somewhat higher than that through the integuments; and finally, a smaller incision through this part of the muscular flesh which adheres to the bone, made round that point of the bone where the saw is to be applied. The proportion of these incisions from each other, he says, must be determined by the thickness of the limb and which the operation is to be performed, making allowance for the contraction of the integuments, and of those muscles which are not adherent to the bone. Supposing the circumference of the limb to be twelve inches where the bone is to be divided, the diameter is about four inches, and if no retraction of the integuments were to take place, a sufficient covering of the stump would be afforded by making the first incision at the distance of two inches from the place where the bone is to be saved, that is, at the distance of the semi-diameter of the limb on each side. But as the integuments, when in a normal state, always recede after they are divided, it is useful to make some allowance for this recession; and to make the first incision in this case at least two inches and a half to three inches before the place where the bone is to be saved. As the posterior muscles of the thigh retract a great deal after the process of healing, Mr. Hey advises this incision to be begun half an inch above the place where the integuments were cut, and the anterior recedes three quarters of an inch. The integuments may be well secured in the back above and below the place where they were divided; for the distance from that place must be computed from the mark laid upon the surface of the muscles in dividing the integuments. Thus, in fact, in a common thigh amputation, Mr. Hey deemed it necessary to divide the skin from the muscles merely to the extent of half an inch at the back part of the limb, and of three quarters in front; a very different practice from the old custom of making quite a long of integuments, and leaving these back as the upper piece of a glove is turned down, or pulled as the sleeve of a coat are turned up.

In common operations of the thigh, there strongly disapproves of separating the skin from the muscles, as a conservative highly unfavourable to the healing of the wound by adhesion; he divides only a few of the collateral bands between the integuments and muscle, and occasionally he has retained M. Leds in cutting through the skin and superficial vessels, saying—

"More vie la Résection de la Tige avec l'Amputation," &c. p. 9.

I believe the generality of the late modern operators are now convinced of the impropriety of dividing the muscles exactly in the manner directed by Mr. Atkinson, viz. by leaving the bone recede unecessarily all round the bone, with the edge turned obliquely upwards towards the point where it is intended to apply the saw. It is a logic, indeed, to which I have already called the reader's attention in the foregoing remarks. Langenbeck says, that he is perfectly convinced of the impossibility of forming a circular wound with one stroke of a large supporting knife, and joins Mr. Hey in approving of the triple incision.—(Edinb. Med. and Surg. Journal, 1855, p. 561.) The objections are urged by Wardlaw against Atkinson's method are mathematically correct, inasmuch as the centre of the edge of the knife, in this gentleman's method, must be equal, and the end of the incision be considerably higher than the beginning of it. Such must be the result of performing the division of the muscles all round the limb by one continued stroke of the knife, with its edge directed obliquely upwards; for the idea of moving the knife reverse in this manner while its point is confined to its regular, regular, downward curve on the bone, I believe, is not abandoned as so really practicable. Yet with the exception of Desjardins, who confined himself to the triple incision conducted on the principles of M. Louis (Edinb. Med. and Surg. Journal, 1855, p. 561), few experienced surgeons follow so acknowledged, that in this operation the

the advantage does proceed from the oblique division of the muscles, the benefit of bringing which method into practice Mr. Adams justly and judiciously doubts, however he may have erred in recommending the circular method to be tried with an amputation of the knee. Nor are there many living surgeons who entertain a doubt of the excellence of the principle advocated by M. Louis in meeting the ends of dividing the lower extremities. First, and then such as are deeper and adherent to the bone. In fact, a combination of this last method with the oblique division of the muscles, not exactly by one but several strokes of the knife, constitutes the mode of amputating at present most extensively adopted, and sometimes termed, as already mentioned, *amputation à la triple incision*. Thus, after the skin is cut, and as much of it as is required and would be as deemed necessary, the operator runs through the lower muscles of the thigh at the edge of the remaining skin, first those on the inner part of the thigh, and then those as are situated behind. For this purpose he makes two or three strokes of the knife, as may be found necessary, carefully directing them, slightly upwards towards the point where he means to raise the bone. The oblique division of the muscles does not merely enable the operator to raise the bone higher up than he could otherwise do, and hence at the same time more secure for covering its extremity, but it is a preservation of sound, uncontracted muscular fibres, which inevitably form the most efficient and durable covering to the stump. It is this without precisely coinciding with Blandin's plan, and, trusting entirely to skin for covering his stump, makes an essential detachment of it from the aponeurosis, and then only straight down to the bone. The latter muscle is merely cut through near its end considerably, leaving those which are deeper and attached to the bone in a condition to be cut higher up than could have been previously done. Lastly, there are also to be divided with the edge of the knife directed obliquely upwards or towards the place where the bone is to be raised. Some operators do more than this; for, after cutting down to the bone, they follow the plan of Volpe, and detach the flesh from its whole circumference gradually with a scalpel, in the extent of about another inch, in order to be enabled to raise the bone still higher up. "Inter osseum et cutem partes integritate scalpula, cito et cum ad os, reliquas ab eo infra cutem, et infra os subscindam, ut de *capsula parte* aliq. distans amputetur." This method, I think, deserves commendation, because it may have considerable effect in lessening a protrusion of the bone, if it does not, in conjunction with the foregoing method of operating and judicious dressings, render this disagreeable event quite impossible. As long as I live, however, I shall never forget a poor soldier, whose thigh had been amputated at Remond-Zoom, and who was brought about ten days after the operation into the military hospital at Orléans, under my care. Not the slightest union of any part of the wound had taken place; abscesses had formed under the flaps on every side of the stump; the loose skin was literally a large bag of putrid matter; the muscles were wasted to almost nothing, and their tendons retracted and shrinking still farther away from the extremity of the bone, which projected at least three inches beyond the rest of the part. This unfortunate man had been attacked with chronic leucorrhoea soon after the operation, and probably it was in the discharge of the stump by the effects of this disease, and in the strong, uncontracted tendency of the muscles to retract themselves, induced by this state of the system, the deplorable state of the stump was to be attributed. He survived nearly a fortnight in the hospital before he died; preferring to which almost large abscesses, communicating with the bottom of the stump, attended the whole use of the patient. As I had every reason to believe that the operation had been skilfully done, perhaps when I saw that the above mode of amputating will make a protrusion of the bone impossible, it seems scarcely possible, as the witnesses may sometimes originate from causes which are quite independent of the particular way in which the operation has been executed.

The practice of discharging the bone from the circumference first in the state of stump, and after the other principal measures are completed, as advised by Crisp and Leroy, I have sometimes seen done at St. Bartholomew's Hospital, and have practised myself on

other occasions, with the decided advantage of letting the bone be raised higher up than could otherwise have been effected. Mr. Guthrie, after the incision down to the bone, even recommends drawing back the muscles from it "at the space of two or three inches, on the side of the limb, or other circumstances may require." But I should be reluctant myself to admit the practice to this extent, though inclined to think most favourably of it within more moderate limits. If no more than three inches of the member be between the first circular cut in the skin and the place where the knife strikes at the bone, and then raise away two or three inches more of the flaps, it is clear that in many examples we should be getting very high up the limb, and if a small part of the muscles from the bone to the extent of two or three inches were thus raised, it would in all events be of no service unless the bone would adhere to being raised at this point distant from the termination of muscular division of the muscles. However, if this were truly practicable, in cases which I have mentioned to yourself, it would certainly be very useful to the accident-prone man, and even by A. L. Petit, that in amputations as high as the bone and so little of the flesh should be taken away as possible.—(*Tratado de Med. Chir. 3, p. 132*). When this kind of amputation of the thigh has been from the bone adopted, certainly, as Mr. Adams says, should be done always to divide the thick aponeurosis covering the femur in the lower part.—(*Mem. sur le Remond à la Paine après l'Amputation, p. 134*).

With respect to Blandin's method of separating the thigh by a vertical incision, already mentioned, he recommends raising the skin obliquely upwards quite unnecessary a few lines back, in order through the muscles, layer after layer, with the precaution of separating the first striated fibres he divides the second; the latter will then cut through on a level with the first that had been previously raised and separated, and so on down to the bone. This, says he, is the right way of forming a free hollow cone, of which the integuments, which were drawn up before the muscles were cut, form the base, from which we gradually contained the various layers of *adiposa*, and the highest part of which is the bone itself. Blandin owns, that this method is sometimes tedious and painful, but in his opinion, those advantages are more than counterbalanced by the benefit procured for the patient.—(*Revue Chir. de Douai par Richer, t. 2, p. 567*).

All the muscular fibres, on every side, having been cut down to the bone, a piece of linen, somewhat broader than the diameter of the vessel, should be torn to one end, along its middle part, to the extent of about eight or ten inches. This is called a retractor, and is used by placing the exposed part of the bone in the slit, and drawing the end of the linen upwards on each side of the stump. In this manner, the retractor will steadily keep every part of the surface of the wound out of the way of the saw. "Grady thinks that in amputations of parts, where there is only one bone, the outer portion of the linen should always be applied over the anterior muscles, as these ought essentially to be most evenly kept back, so that no portions of them may interfere with the action of the saw."—(*Norman sur de l'Amputation par Grady, p. 110*). This is a preference, however, which may not be of great importance, though I confess that there appears some reason to think Grady is right. This meritless surprise, J. L. Petit, whose name I always mention with pleasure, strongly commands the use of the retractor, the ends of which he drew over the anterior muscles; he says that he has employed this simple and useful means, but that it did not end the bone of every body, especially of those who consider all the work of an operation is caused in the question of its performance, as he thinks it unnecessary reasoning to say, this is the true way.—(*Tratado de Med. Chir. 3, p. 132*). I have seen the bone do much mischief in consequence of the operator neglecting to use the retractor, but my conscience obliges me to remove such surprises as might be derived from the use of this simple contrivance. There are some who have rejected the use of the retractor, because they have not it put under the neck of the saw, and observe the action of the instrument; but this very circumstance added against the retractor is, when considered, the strongest one that could possibly be brought forward in its favour, as the surface of the wound itself, and particularly the edges

of the skin, would, in all probability, suffer the same fate as the bone, by getting under the teeth of the saw, if an operator were employed, in attempting to cut the bone high up, as closely as possible to the soft parts. I think no one can then say that these frictional objections to the use of the peritonæum, and I know that many who have been with myself are witnesses of the practical frequency done by the saw in amputations, are deeply impressed with its utility to the object of this language. I have often seen the soft parts skillfully divided, and I have, in these same instances, seen the operators directly adjacent to the saw all the while, which every one was ready to believe, by their usually sitting through one-half of the ends of the flanges together with the bone. Men with liberal feelings are to enter a sigh, not to let a given be lost, at their previous asseverations, but now had their presence more excited than they by themselves, the possible means. But because defending the surface of the saw from the teeth of the saw, the operator will undoubtedly avoid the operator to save the bone higher up than he could otherwise do.

Mr. Lister, of Edinburgh, endeavors to state, that the saw is the only necessary thing in the case of amputating instruments; and he adds (adding, as I suppose, to amputations at the joints), that it was seldom required that might be supposed; and as particularly occupies all kinds of amputation apparatus. Here it should be remembered, that the gentleman's practice is that of disarticulation, so which he gives the internal peritonæum; a method in which undoubtedly the peritonæum may be divided with, as, while the saw is acting, one or both of the flaps can be effectively held out of the way by an assistant. The same principle also explains, in some instances, the surgeon's rejection of the instrument, the application of which is so convenient in certain disarticulations. (See *Edinburgh Med. and Surg. Journ.* vol. 28, p. 43—44.) Here, however, I am trusting amputations by the circular incision, as which practice I consider best the instrument, and the operator too, would be commonly recommended.

Another proceeding, which seems fit for regulation, and which, indeed, Mr. Alcock very properly condemned, is the practice of scraping up the peritonæum with the knife, as far as the muscles will allow. Nothing seems more probable, than that this way is the cause of the excruciating pains which necessarily happen after amputations. At all events, it is a cruel, needless measure; as a sharp saw, such as ought to be employed, will never be expected to go slower than the bone as the peritonæum. All this the operator ought to do is, to take care to cut completely down to the bone all round its circumference. Thus a circular division of the peritonæum will be made, and upon this point strikes the saw should be played. This is the method which was approved of by J. L. Petit. (Treatise on the Saw, &c. p. 108.) If it were I have always done and recommended; yet it must be confessed, this difference of opinion prevails about the necessity and fitness of dividing the peritonæum. Gracile, in coming with several others, entertains considerable apprehensions of the effects of the peritonæum being torn and lacerated by the saw, excruciations of the bone and muscles up to the point being possible consequences of the high operation and inflammation of this membrane. Hence he is an advocate for making a circular cut through of the place where the saw is to be applied, and then scraping away all below that point as the flange descends. (Norman for the Am. practitioner, p. 166 and 167.) Perhaps no very great objection may be against this mode, which is not necessarily followed, though I have some doubts of its utility, as it seems seems preferable is the habit of the having of least to hit with the saw the precise point at which the remains of the peritonæum remains; and in confirmation of the utility of Petit's practice. Mr. Gracile's experience may be added, who says, "I have often moved through the bone, without previously touching the peritonæum, and the excruciations have been lessened, and with its little inconvenience to any others." (On Gun-shot Wounds, p. 165.) A very modern author, impressed, like every other, with the fear of tearing the peritonæum with the saw, differs from them, in thinking it best to cover the peritonæum, especially by which means, he says, that at least half as much of this membrane, and a very

portable quantity of muscular flesh, may be preserved for covering the end of the bone, inasmuch as the muscular fibres adherent to the peritonæum will remain contained within; an advantage which this practice secures very important while the edge of the bone is sharp. Inasmuch as the bone, by covering the method highly useful, as the sharp edge of the bone may be not nearly covered with it, but peritonæum and the cellular membrane contained with it, thereby the adoption of this practice, to secure as this book has set a very long time and may occasion of the skin, and some other protection of the bone of a strong. (Edinburgh Med. and Surg. Journ. vol. 28, p. 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

that in no part of the operation of amputation do operators in general display more awkwardness, than in scraping the bone, though, if we except directing the saw against the flesh, the facts are here less pernicious in their consequences than the effects already named. At the time of scraping the bone, much depends upon the assistant who holds the saw. If he elevates the lower portion of the thigh bone too much, the saw becomes obstructed that it cannot work. On the other hand, if he allows the weight of the bone to operate too much, the thigh bone breaks before it is nearly sawed through, and its extremity is splintered. It is one of the most common remarks of such persons as are in the habit of frequently seeing amputations, that the part of these operations, which a plain carpenter would do well, fails the skill of a commoner surgeon, and few operators begin themselves well in the management of the saw. Many of them begin the action of the instrument by moving it in a direction contrary to the inclination of its teeth. Many, seemingly through confusion, endeavor to shorten this part of the operation, by making short, very rapid, and almost convulsive strokes with the saw. Almost all operators fall into the error of bearing too heavily on the instrument. The operator will now best, who makes the first strokes of the saw by applying its head to the bone, and drawing the instrument across the part towards himself, so as to make a slight groove in the bone, which serves very materially to steady the future operations of the instrument; and who makes long regular sweeps with the saw, rather slowly than quickly, rather lightly than heavily. But there is often a slight in the construction of the new steel, which impedes its action, quite independently of anything on the part of the surgeon. I allude to the edge of the instrument not being a little broader than its blade. When the saw is well made, the work always makes plenty of space for the movement of the rest of the instrument. The instrument, as Mr. Gracile recommends, should cut with both edges, backward and forward, which expedites the operation, and what is of more consequence helps to prevent splintering when the bone is nearly divided, because the division can be finished by the backward stroke, which are the most gentle. (On Gun-shot Wounds, p. 165.) Gracile commends the plan of using the saw, for the purpose of facilitating its action (Norman for the Am. practitioner, p. 165.) and though the method is incorrect enough, the best operators in this respect do not consider it sufficiently important for adoption. If the bone should happen to break before the sawing is finished, the sharp-pointed, projecting spicule, thus produced, may be removed by means of a strong, cutting sort of forceps, termed bone-spreaders. The perpendicular division of the bone, across a sharp edge at the extremity of its circumference. It is not the common practice to make any allowance for the removal of such sharpness; yet Gracile recommends doing it away (Op. cit. p. 165), and Mr. C. Hutchinson makes it an invariable rule, whether there be any occasion to use the bone-spreaders or not, "to take off the splinters, and scrape or rub down the saw so as to round the sharp cut edge of the bone with a mouse bone scalp, in order to prevent the soft parts from being lacerated.

were brought over the end of the bone, in fitting the stump.—*Pract. Obs. in Surgery*, p. 54. Though I have not followed this practice, or rather the part of it which relates to setting off the edge of the bone, as soon as adapted to lesions in amputation of the thigh, I know of no objection to it, unless it be on the score of its feasibility, and the other without occasion. All preceding points of bone, it is the ordinary custom to remove.

After the removal of the flesh, the femoral artery is to be immediately closed with a pair of forceps, and tied with a firm round small ligature, the knot being tied kind which is recommended and used by my friend Mr. Lawrence.—(See Ligature.) Care is to be taken to turn the accompanying lymphatics of the anastomosing vessel out of the wound. Now if the removed limb ought to be tied, though the ligature should not be placed round the artery, just where it emerges from its adventitious sheath. The late Mr. Hey was inclined to tie the femoral artery twice, leaving a small space between the ligatures. Some reasons against this plan will be found in the article Hemorrhage. The other arteries are merely taken up with a thread. After tying as many vessels as require it, one-half of each ligature is to be cut off towards the knot on the surface of the stump. One portion is quite sufficient for withdrawing the ligature when that becomes loose, and the other being only an unnecessary bulk, and productive of irritation and suppuration, should never be allowed to remain.

My friend, the late Dr. Herman, in his excellent publication, justifies the improvement of removing one-half of the ligature to Mr. James Vesich, a minor surgeon, who, in April, 1808, published some valuable precepts relative to the mode of tying the arterial in amputation.—(*See Esch. Med. and Surgical Journal*, vol. 2, p. 176.) But highly as Lawrence of the error of the anonymous paper here referred to, it is impossible for me to suppose Mr. Vesich could be the first, or modify the first, who suggested such improvement.—When I visited an apprentice to St. Bartholomew's Hospital, in 1775, an surgeon of that hospital ever followed any other mode, and the practice was then so far from being new there, that practitioners who were at the hospital seven years before myself, had sent one-half of each ligature regularly cut off the first time they went into the operating theatre of that magnificent institution. The use of very broad ligatures, and the inclination of a considerable quantity of flesh in the wound, together with the vessels, were also practices quite exploded at St. Bartholomew's at the very beginning of my apprenticeship. Mr. Vesich, however, seems to merit the honour of having been perhaps the first to see the example of tying every vessel, the Professor, as well as another attending, with a single silk thread, taking care to include, as far as was possible, round the artery; and when this had been done, he took off one-half of each ligature, as well as possible in the knot, "so that the future matter absorbed was a mere rind, exposed much what I had seen answered to me."—(*Esch. Med. and Surg. Journ* vol. 2, p. 176.) The use of a single silk thread, therefore, was the part of these improvements, probably originating with Mr. Vesich, though the principles which led to his innovation were unquestionably first suggested by Dr. Jones.

Mr. Adams directs the ends of the ligatures to be left hanging out at the two extremities of the wound according as their nature may point out at last. But when a ligature is situated in two wounds of the wound, it is best to bring it out between the strips of absorbent plaster, at the lowest part of the surface, afterwards extending across one-half the wound to put it under angle, would cross a great deal of useless erythematous and suppuration. The advantages of this method of placing the ends of the ligatures were well explained by Mr. Vesich. In his practice, the the direction of cutting off the half of each ligature, has been common in the London hospitals, and at St. Bartholomew's in particular, many years since, I presume, that this was believed to be the practice; since it has been frequently adopted in those institutions ever since 1795 as I can testify from my own personal observation. These remarks are offered without the slightest intention of disputing from the views of the above-mentioned paper, which to repeat with valuable effect, nor am I influenced by any design of throwing

loss on the history or character of any other individual at the expense of Mr. Vesich, being at the same time unacquainted with the exact periods when either this improvement, or that of removing the half of each ligature, commenced. Mr. Ross is one of the few reasoning modern surgeons who declare their preference to the method of bringing out all the ligatures at the lower angle of the wound; the benefit of having them brought out thus low, so as to keep up a drain for the day just that they first being in the position greater than that of arranging them in the points of the wound nearest to them.—*Mém. sur la Résection de la Humerus* (Arch. p. 25.)

As Mr. Herman observes, the following are the admirable rate and order of ligatures, the separating the threads of which they were composed, and placing them at convenient points along the line of the artery, or vessel, and the actual removal of one-half of each ligature, were improvements very closely made;—1807 says he, "an improvement which appears to me of great consequence, was the last of interference, and is now the source of adoption, although the artery once secured, and the value of adhering duly acknowledged, it is the most obvious of all." I allude to the plan of removing the ends of the ligatures altogether, and then leaving it to extensive wound the greatest possible chance of immediate union." The first printed mention of this practice, as far as Dr. Herman's investigations have discovered, was in a letter written by Mr. Haire, dated Southampton, Essex, Nov. 1795. "The ligatures," says this gentleman, "sometimes become troublesome and retarded the cure. An intimate friend of mine, a surgeon of great abilities, proposed to cut the ends of them off close to the knot, and thus leave them to themselves. By following this plan we have seen strange issues in the course of six days. The blood ligatures thus cut in consequence made its way out by a small opening in a short time without any trouble, or the patient being sensible of pain."—(*See Esch. Med. Journ*, vol. 2. Certainly, considering the backwardness of the surgeons of the method, as Dr. Herman remarks, is very satisfactory.—*Principles of Military Surgery*, p. 116, ed. 2. In a letter received by me from Mr. Haire, surgeon at Southampton, and dated June 2, 1819, he tells me, "My predecessor, Mr. J. Wilson, the late purser of Mr. Haire, suggested a fresh in 1795 or 1796, and cut off the ligatures close to the arteries, and so to be avoided. He followed the recommendation of Mr. Haire, who had sent some of the method practised on the continent." In September, 1812, Dr. Herman, who was serving with the army in Spain, taught the adoption of this plan, which, he expected, would not only prove useful in preventing immediate union, but in avoiding any accidental violence to the arteries, and the wrong interference of the younger doctors in trying to cut them away. Between September and January, thirty-four cases were treated in this way without any consequences following, or the small particles of silk left behind giving rise to any apparent irritation. Dr. Herman also mentioned to me 3. Mr. Greer, some of the small circles of silk, a part of which had come away with the dressing, while others had shewn out on opening the silk particles, which formed over the face of the stump at the place where the arteries had been tied. Some few of the ligatures never made their appearance, and the patients complained of no uneasiness whatever. Observed by the staff of the method, Dr. Herman afterward published an account of it.—(*See Esch. Med. Repository*, vol. 2, p. 175, and vol. 5, p. 261.) This gentleman subsequently feared that Dr. Maxwell of Bradford had adopted the plan as far back as 1798; and Mr. Fortescue, who was at Stockton during the period of Ayrton, was also then followed by some of the surgeons of that city, without any ill effects.—(*Hercules Military Surgery*, p. 175-176, ed. 2.) In July, 1814, Mr. Lawrence communicated to the Medical and Chirurgical Society of London, seven cases and observations highly in favour of the method, and the proceedings which he lay each stress upon as being for the purpose of making firm incisions, composed of what is called Vesich's silk.—(*See Esch. Med. Journ*, vol. 9, p. 176.) And in a paper of later date, he says, his former opinions had confirmed the necessity of the method, "that this plan, by destroying irritation and inflammation, and simplifying the process of dressing, was anti-

fully protects the comfort of the patient, and the success of the surgery, which it has not produced in consequence of any unpleasant effect, in the cases which have come under his own observation." According to Mr. Lawrence, the small knots of silk generally were very early, and came away with the discharge; that when the integuments have united by the first intention, the ligatures often came out rather later, were very indolent suppurations, and that, in some instances, they remain quietly in the part.—*Mem. vol. vi. p. 5, 6, 7.*

After the case of Wounds, it occurred to me to send to Mr. Collier and to myself, though our ligatures were certainly not so intricate and elastic as those employed by my friend Mr. Lawrence, whose plan essentially requires the use of elastic ligatures made of double silk. As I found two aprons the first after the case, and was therefore obliged to wear my patients at three days to the use of the elastic, I lost the opportunity of witnessing the effects of this method. The next Mr. Collier I attended himself, and the new plan and the method were applied to his patients. It seemed almost equally well; with the exception that we did not use the smallest ligatures, which he regarded as indispensable. When the plan is tried, single among threads and silk, or under the kind of regularity which will be described in some place (see *Lectures*), there is no supposition, for otherwise, the knots would be large, and liable to cause suppuration and future trouble. The method has likewise been tried by Dr. Keen on Staphylococci, but it is not explained whether he used single threads or silk, or whether any improvement resulted from the method.—*See Bulletin de la Société des Sciences en 1844, on Paralytic de la Chaire d'Anatomie de la Clinique Française par P. J. B. vol. 1, p. 112.* Yet, another surgeon has to state, that the method is not generally adopted, and that one of the best writers, as I shall hereafter mention (see *Hesperides*), has noticed a case and some experiments which are unfavorable to the practice.—*Ibid.*, in *Ann. Med. Chir.*, vol. 7, p. 155. By Mr. Astley Cooper, the practice has been stated as abandoned, and he has himself given it up.—*Lancet*, vol. 1, p. 118. Mr. Keen, in two of these instances, has also some sort of looking elsewhere than from the presence of the knot of ligature, though he approves of the plan when the wound will not unite by the first intention, which, however, can hardly be known beforehand.—*On Gunshot Wounds*, p. 301. On this subject, a more particular attention, that no case can be regarded as the trial of Mr. Lawrence's method, unless properly such ligatures as he himself employs be used.

Dr. Koch, Professor of University Surgery at the University of Munich, Bavaria, after performing the operation on the thigh, contents himself with approximating the flaps without securing any vessel; that is, he keeps the flaps together, as he finds them keeping the cut surfaces in perfect co-aposition is sufficient to prevent hemorrhage, and his success has been truly surprising. Dr. Wagner has long since been in this country, that ligatures may be dispensed with in cases of gunshot wounds, in which they are not only applied by most surgeons, but thought indispensable. See the report of his operation for removing the bone, in which he used no ligatures. Many surgeons in this country are satisfied with securing the large arteries only, and even the risk of subsequent hemorrhage from the smaller vessels rather than multiply their ligatures. Professor Parry of Maryland, did take the opposite extreme—once having encountered this secondary hemorrhage in the early part of the practice, he would never make a single artery without a ligature, if he could distinguish it, and would often wait half an hour after the operation before closing the stump. He operated with singular violence; that it has had some ligatures, few cases would not have been reported for the clearing of their patients' consciences. He used to say in his lectures, that anyone who has bleed and bled; there is no safety in it without the rope there.—*Ibid.*

Sometimes the second surface of the bone itself bleeds rather profusely. When this happens, it is an excellent plan, which I have often seen the late master Mr. Keen use, and elsewhere with the greatest success, to hold a compress of linen over the end of the bone during the time requisite for securing the end of the

vessels. At the end of this period, the compress may generally be taken away, the bleeding from the bone having ceased. As Mr. Keen remarks, the bone goes down and is covered himself with a very early such vessels as he always through the bone, while the patient is laid with pain, he would undertake to state that those that bleed stop by a vessel, and these stop of the compressed bone will stop, and in many cases the small vessels naturally all the surface of the stump, for otherwise he may expect to be obliged to a fresh hemorrhage. He states all the details.—*In the Appendix of the Larger Edition, p. 477, Moore's Works.*

When there is merely a wound from a small vessel, Dr. Keen's advice to secure the stump completely is not only proper, after the operation, and waiting the stump with a little cold water, will not an artery may be easily bleeding, without any danger for some time. A good deal of time is sometimes lost, then the result of the large vessel, and when they bleed much in the internal vessels, I think Dr. Keen is right in recommending there is to be.—*On Military Surgery*, p. 204. There is no necessity for doing so, however, in ordinary cases, nor should I be obliged to secure Mr. Keen's, in consequence of the time, and a new method of binding from the stump, generally secured that space in the stump along with the artery.—*Practical Medicine*, p. 215, vol. 5. The method was suggested by the late Mr. Keen, who said, that if the vessel be left open, and the surface of the upper part of the bone be left high, the fluid in the vessels will flow out, and the stump will be in this position, and it will be in the same way. When the cut and open the bone, as they happen, are secured, the bone is in the position of the artery, and the cut is left open, which being done, the two vessels lie in the same way, and are secured, and are left open, but if they are not in their position, they must be left open.—*Practical Medicine*, p. 215, vol. 5. Dr. Keen's method, it is not the usual practice to be the normal way; and except in particular cases, I cannot see the reason for leaving a ligature on a large vessel, something which a ligature and a final instrument within the vessel, while the intervention of the vein between the two ends of the artery of the ligature and the artery, some rather tend to make the third than anything in the most desirable manner upon the whole.

The wound is now to be covered with strips of elastic plaster, so that the edges of the skin only form a straight line across the face of the stump. This was the mode recommended by Alcock, and is what is preferred by the generality of surgeons in this country. It is also advised by French.—*Notions sur les Affections Chirurgicales*, p. 105. *Traité de l'Amputation*, p. 105. From these places and the mode of the ligatures it is best to place some pieces of lint, spread with the liquid plaster, in order to keep them from sticking, which becomes an exceedingly troublesome circumstance when the dressings are to be removed. I am decidedly averse to the general plan of placing the stump with a large mass of plaster, pomade, ointment, flannel, &c.; and I am so aware why the strips of adhesive plaster and a piece of simple lint should not suffice when surrounded by two gross bandages and a wetted flannel, applied equally round the limb from above downwards. The first line of the elastic, indeed, should be laid round the neck, while the lower circumference is the same, indeed, then called the elastic line, over the end of the stump. It is also an excellent method to have some fine interposing between the plaster, say a string to keep the lower bandages constantly wet with cold water. In this way my discharge will usually escape, and the stump, being kept cool, will be in the most favorable position for healing.

Mr. Astley Cooper writes, that he has seldom witnessed with his stumps where the flaps are taken, a pector was not required, which, he says, prevents attraction of the tendons and exposure of the parts. After applying the plaster, and bringing the instruments together, he holds over three strips of adhesive plaster over the wound, and also round the stump to keep the ends of the plaster in their place. He then makes the stump a piece of white and washed. *Lancet*, vol. 1, p. 150.

Take completely of opinion with Mr. Alcock, that the stumps would not themselves placed over all the backings and dressings, if put on with a good deal of care, has a tendency to push the dressings away from the extremity of the stumps, and as it must also rest the part, the employment should be discontinued.

If possible, the dressings should never be removed before the fourth day, not allowing the use on which the amputation is performed; and Sir Astley Cooper gives instructions both at night-day, nightly dressing on the fourth day, and of course in order to be laid any dressed matter.—See *Lancet*, vol. 1, p. 121. "Harris also put down the fifth, sixth, or seventh day as generally more proper for the change of the dressings. He is, however, that if the state of the wound should become offensive, the night dressings may be removed sooner. Even when the dressings are so to change every, it will frequently be found useful not to remove one strip of plaster; but the dress must be new laid, and any too large wound strip.—These and other valuable remarks, derived from the practice of Dr. A. Harris, might not having their great value, and the convenience of being possible to be adopted by every surgeon.

The manner of bandaging the dressings of stumps is indeed a very important business, which should never be entrusted to apprentices; for in taking off the strips of sticking plaster, if done carelessly, not taken, the right and usually formed adhesions may be torn asunder. Thus, as Mr. A. S. Halliwell has remarked, if the strips be pulled off by holding one end of a strip tightly in the right hand, and the other end of a strip in the left hand, with the thumb and forefinger, the strip will be pulled off with a jerk, and thus a separation of the most recent portions of the stump.—Mr. John Joseph has "to reflect the wound end of the strip close down upon the adjoining part, and to bring it gently forward with one hand, while the successive parts of the strip is followed by two fingers of the other placed over the skin, &c. and when removed, it is drawn from the skin, as the end of the band of muslin to the end of the stump, it also removes the other end is brought down and wholly removed."—*Pract. Obs.* p. 46.

In order to hasten the removal of the plaster, and save the patient a great deal of pain, I have always followed the plan of using warm water daily over them, gives a sponge for a few minutes purposely in the attempt to remove them. In the early part of the treatment, it is also a valuable rule never to let every strip of plaster be off at once, unless to leave the skin quite unobscured. Some skill and care are also necessary, in order to avoid pulling away the ligaments with the dressings.

At the end of five or six days the patient may begin to try, in a very gentle manner, whether any of the ligaments are loose; observing, before he does this, suddenly pull them directly towards him. However, he should not use the smallest force, nor permit, if the limb is not quite pain. One would hardly say whether the ligament on the stump is loose, unless the stump is laid on a cloth day. If it is loose, (ligaments made of ligaments will be supplied, and with their ends cut off close to the bone, of course, this delicate business of trying to get at the position of these foreign bodies is entirely superseded.

Though in the above account I have directed the edges of the wound, after the separation of the thigh, to be brought together in such a way that the wound will appear as a line across the face of the stump, yet there are instances in which the wound seems from being and eventually covered, by making the line of the wound as a perpendicular direction.

Mr. R. Bell, indeed, expressly approved of it, as affording a ready outlet for matter. It is likewise directed by Mr. R. Bell. (*Op. Surgery*, vol. 1, by Bell.) *Mémoire de R. Bell, dans l'Année de la France, après l'Empire*, p. 11, and by Dr. Hennen, *the Military Surgery*, p. 203, et. 2.

On the other hand, Mr. C. Hirschman objects to it, because it seems to him, that when a stump thus put up is laid on a cloth, the pressure tends to separate and open the lower part of the wound.—(*Pract. Obs.* on Surgery, p. 37.)

It is obvious at present, however, that the thing which leads this pressure to disunion of the skin is one which would be applied to the lower part of the stump, and not actually laid by the pressure of the lower part of the stump, as the pressure of the lower part of the stump is laid by the pressure of the lower part of the stump.

Whatsoever discharge occurs may find a ready exit by.—*M. M.* et. p. 14.

Mr. Alcock directed to this method, asserting that the wound afterward became united immediately over the end of the bone, the pressure of which was very likely to make the part cicatrize. However, in St. Bartholomew's Hospital, there were few cases of the wound, occasionally brought together in the proper direction, and rapid strapping made in this manner. In a case in which I assisted Mr. Russell at St. Bartholomew's Hospital, when an attempt was made to put up the wound in a correct manner, the bone, second, to make an attempt to separate against the skin, which did not happen when the line of the wound was made in the same direction, which of course was immediately adopted. Mr. Hay has noticed this subject as follows: the integuments and muscles may be brought together by pulling over the anterior and posterior parts of the sides of the thigh together. The former method, by the gradual retraction of the posterior muscles, causes the integuments of the anterior part of the stump to cover more completely the extremity of the bone. The latter method covers the integuments and muscles to meet each other the more readily, and the effect is in the perfect when the quantity of soft parts concerned is somewhat deficient.—(*Pract. Obs.* on Surgery, p. 233, et. 2.)

The plan of bringing the edges of the wound together after separation, so that they may unite by the first intention, has, however, for many years past, the universal approbation of British surgeons. It is their general practice in the treatment of all second wounds. It may be said to be the plan of English surgery; for, as we have seen, that English were formerly but superior. Thus, Laing, however, in cases of amputation, disapproved of the attempt to unite the wound by the first intention, and merely brought forward its edges somewhat towards each other with a piece of linen, that covers the whole of the wound, and has small incisions in it for the passage of the discharge.—*Mémoire de Chir.* M. 1, 2, p. 378. This piece of linen is expected with a moderately tight roller.

M. Roux, on his arrival in this country, wondered to see British surgeons so popular in favour of union by the first intention, as to select it after all expectations. "C'est certainement au bout de la réunion, la date que de l'appeler on se souvient, et la plus grande de l'opération des membres. Faut-il parler de l'opération dans la continuation des membres, et plus particulièrement encore de l'opération des membres."—*P. 125. Parallele de la Chirurgie Angloise avec la Chirurgie Française*, tom. Paris, 1815.) But M. Roux has extremely contented to explain in his book what are the advantages of not bringing the edges of the wound together, and why he is so prejudiced the particular method, the superior efficacy of which is constantly demonstrated in every hospital of London. He does not indeed promise to condemn the practice altogether; on the contrary, he allows it to be proper in certain cases; yet he declares that it ought to be avoided within particular limits.—(*P. 131.* See also *M. M.* et. this case in Roux's *Année de la France après l'Empire*, tom. Paris, 1814.)

In this tract, which is well drawn up, Roux proves and convincingly the benefits of union by the first intention after separation of the thigh by the circular incision, but, strangely enough, his paradoxical knowledge from advising the practice to be extended to other amputations. He does not positively condemn it in the first, though he thinks the method less necessary, because separation there is less dangerous than in the thigh, &c.—(*P. 43.*) Yet here little reasoning is the author involved by the inconsistency of his doctrine. He also directs the attempt to union by the first intention, recommended where there are organized for injuries, which evidently separate and crush the parts.—(*P. 48.*) and where the limb is much wasted.—(*P. 48.*) In the latter condition, however, he thinks Hennen's recommendation may be done, and an effort made to find the wound by adhesion. In one case he did this with success.—(*P. 51.*)

Edmond referred to this subject at Paris follows the plan with a success equal to that of the London surgeons. For some years past, he has himself been constantly encouraged to accomplish union by the first intention, after all the operations which he has had, because so possible, and so successful at least in

diffuse to the blood in the artery. When an artery is cut, the blood, coming off, requires the pressure of the heart and arteries to dilate, and force more blood into the other branches. But blood being cut off, the temperature will point out that blood, and no hemorrhage is known as. Making such pressure round the stump is a sure way of stopping it, and whenever there is an external source of blood it would be concerned the pressure to be sure that the circulation in the artery is not so impeded by the pressure of any ligature or dressing.

If the bleeding should not be from an artery, or an aneurysm, the application of warm clays in post water, will sometimes check it, and the compressible property for moving the dressings and opening the vessel that then be avoided.

But it often happens that the wound must be opened, and the bleeding vessel cut. This was very painful, and when the dressings have been applied some hours, so that the artery has had time to dilate, nothing can avoid the suffering to which the patient is now exposed. Here we see the necessity of being particularly careful at first to the every expression of pain.

The second sort of hemorrhage after amputation comes from division of the large arteries, and may occur a month after the operation, when the ligatures are all away, and the patient seems perfectly well.

Two such cases are related by Mr. Bramble, — (Vol. I, p. 267). — Now that the plan of cutting the artery with a steel wire is adopted, this kind of bleeding is less common than formerly. When the bleeding vessel is large there is no chance of getting the patient out of danger, except by cutting down to the vessel and tying it. The trunk of the vessel, however, may sometimes be more conveniently tied than the bleeding branch itself.

Mr. Hey makes mention of a particular sort of hemorrhage after the operation: "I have seen," says he, "a few instances of the hemorrhage becoming so continued after the operation as to compress the veins just above the extremity of the stump, and bring on other more fatal consequences. When it has appeared clear to me that the hemorrhage was venous, I have made a division of the integuments on one side of the thigh, sufficient to expose the artery and this method has immediately stopped the hemorrhage." — (P. 531, edit. 2.)

I have never yet met with a case in which a hemorrhage was immediately produced by a contraction of the integuments. Dr. Hennen says that he has seen only one example, and it was successfully treated by loosening the bandage and immersing the dressings with cold water. — (On Military Surgery, p. 284, edit. 2.) Doubtless may therefore be entertained, relative the same was the pressure of the integuments or of the artery on the veins.

In Mr. Gaultier's truly pleasing work there are some excellent remarks on the hemorrhages which, in an amputated and sloughing state of a stump, frequently take place from the small branches, or from the main trunks of the arteries, in consequence of elevation. It is always so, not always easy to discover the bleeding vessel, or, when discovered, to secure it on the face of the stump; for, as the elevations proceed less and less, and the end of the artery, which is to be secured, is not so near, no healthy action takes place. The ligatures very soon give way through, or it is thrown off, and the hemorrhage returns; or some other branch is opened, and another ligature is required which is equally uncertain; and under this succession of ligatures and hemorrhages the patient dies. Here coming down to the principal artery in preference to another amputation was often recommended; but under certain circumstances a failure, and amputation becomes ultimately necessary. At the same time it is allowed that this operation may succeed. On the whole, Mr. Gaultier promises himself to be an advocate in most cases for tying the artery in the first instance; and if this proceeding should not succeed, he would then amputate. However, the practice of taking up the artery, he thinks, should not be adopted indiscriminately, the doctrine of amputation, not being here applicable, because there is a wounded vessel with an external opening. "In the thigh the operation is less useful than in the arm, and especially if it is not the main artery that bleeds; for the trunk of the vessel which the hemorrhage proceeds from

comes from the profunda, and tying the artery in the arm is a great mistake would be doing a wrong operation, and one which probably would not succeed; the consequences, however, would be more the same as tying the artery in a wound case, and again, in such a case, it is to the profunda artery that usually the hemorrhage is again sent, if it is very active, and continued hemorrhage. Therefore, in such a case, the operation which the bleeding artery should be tied, and the stump cut off, is the best. — (On the stump, p. 155, 156). Thus far the advice seems to be correct and valuable; but when an aneurysm must be removed by taking up the artery in the groin, the doctor must lower down, I doubt the propriety of preferring amputation to this other less severe operation, provided the efficiency of a ligature above the profunda is proved in the manner already recommended by Mr. Gaultier, viz. by means of pressure.

The following is the method offered by Mr. Hey: "When we are under the necessity of amputating a limb that has suffered great extension, though the operation is performed upon a part apparently sound, the wound sometimes becomes deeply and ill-conditioned. No good gradations arise to cover the extremity of the artery; but the ligatures cut through these vessels, or becoming loose, come to make a sufficient protrusion from them, and hence repeated hemorrhages occur. This is a dangerous state for a patient; for if the vessels are taken up slowly with the needle, the hemorrhage will stop and then return in the course of four or five days. In such cases, the application of dry sponge and transvergency, as described by Mr. Ware (Lectures in Surgery), has been found singularly useful, and has saved the life of the patient. On a constant pressure must be kept upon the process of sponge by the fingers until extension of the stump, till granulations begin to arise upon the stump, and the prospect of future hemorrhage disappears. This method is of the greatest importance after amputation on the thigh or leg, where the great vessels are deeply seated. In the arm, above the elbow, where the vessels are more superficial, the great artery may be taken up with a portion of muscular flesh above the surface of the stump, by making first an incision through the integuments. My colleague, Mr. Logan, has done this twice within the last year with complete success, when repeated ligatures, applied in the usual way, had failed."

In the most deeply seated state of the stump above mentioned, the application of lint, soaked in a liquid composed of equal quantities of benzoin and rectified spirit of wine, has been found very advantageous, and has caused it to get on well in a healthy state. — (P. 537, edit. 2.)

When this operation is necessary in amputated limbs, where hospital gangrene is prevailing, Deleclie recommends the practice of cutting off the ligatures close to the knots on the vessels, so that the tips of the wound may be more completely and accurately brought together.

By this means, as his experience has taught him, the risk of the stump being affected is materially lessened. The small branches of the ligatures enclosed in the stump, he says, are distinguished in a period when the patient has reached strength enough to be moved into a healthy atmosphere. Little suppuration being produced, the tips, even, and healing by nature within twenty-four hours. He mentions that he has never seen the practice give rise to an abscess. Deleclie is led by the case histories of the consequences of suppuration, and the continuance of suppuration, to prefer bringing the tips of the wound together after amputation of the thigh, so that the line of the wound may be transverse and not perpendicular. His reason is, that most of the ligatures which unavoidably produce suppuration are placed on branches of the profunda in the posterior part of the limb, consequently here the greatest contraction follows contraction, and the anterior flap is thereby drawn over the extremity of the bone in the most advantageous manner. — (Lectures on Surgery, &c., p. 335.) The same author gives us an instance of the failure of a suture in tying a broken thigh-bone, where no time had followed a long trial of common means; and he was in the end obliged to

system and the external system should be mutually excluded.—*Encyclopædie Méthodique, Paris, Class. 5. 1. p. 31. Lancet Surgery, vol. 2, &c.*

FLAP-OPERATION OF THE THIGH.

Although I concur with the majority of surgeons in regarding the operation by a circular incision the most superior under ordinary circumstances, no doubt can exist about the preference which should be given to amputating with a flap in particular examples. The subject, as Dr. Smith has well remarked, ought to depend on the state of the limb and nature of the injury requiring amputation. "One surgeon may be devoted to the double-flap operation, that to perform the other method, though the comparison in the same hospital is lodged in the double-flap operation, and never amputates but after this manner. But the disappointed practitioner will look to the quality of the case, and adopt means accordingly."—*Lancet, No. 248, p. 251.* Notwithstanding this good doctrine, however, Dr. Smith is in reality very partial to flap-operations, admitting that there is only one part, viz. the upper third of the thigh, where he would recommend the double amputation to be preferred.—*Op. cit. p. 251.* At the same time, he confesses, that when the extremity is crushed and flayed, Dr. Pagan's mode with a single circular incision, is that to which he has leaned from the preference. He admits, also, the frequency of tedious suppuration and infection after flap-operations, which ends, however, he assigns to the fault of putting the flaps too long.—*Op. cit. p. 251.* Flap-operations of the thigh, however, are the reported advantages of being best exposed to the danger of a protrusion of the bone, and, hence, I think it may be advisable, whenever any disease arises in the state of the parts, or the constitution, for amputating with a disjunctive incision. An experienced military surgeon informs me, that, in the six years of his practice, he performed several amputations by the double incision, strictly according to the precepts of Wauson, Desault, Pott, and Paré, but that the malpractice is more common in which the bone protrudes, though the greatest circumstance was used in the operation and after-treatment. Hence he was induced to make trial of the flap-operation, and although he invites criticism in not attempting to keep the flaps close together for the first six, or eight days, he reports that the stump is generally healed in twenty or thirty days, and suppuration rarely happens, on account of the bone being so well covered. In short, he says, that this method is to be preferred to all others.—*J. R. Paganus, Opus. de Chir. p. 185–202. Paris, 1808.*

Mr. Syms also informs us, that, though the flap-operations were by him have been very numerous, he has never met with an instance of the bone protruding or extruding after them.—*Ed. Surg. vol. 14, p. 28.*

A description of Desault's or rather Verduin's mode of operating, being given in the First Lines of the Practice of Surgery, I need not here repeat it, nor say by how many respectable names the practice is sanctioned. In Guy's Hospital, flap-operations of the thigh seems now to be mostly preferred. The operation is also sometimes adopted by my friend Mr. Vincent at St. Bartholomew's Hospital, who showed me, some time ago, a capital stump which healed well in five weeks, and which healed with great expedition.

If Mr. Guthrie's flap-operation is considered preferable to the circular incision at the upper part of the thigh, "as it restores the head of the bone to be removed if found necessary, allows it to be examined and cut short with greater ease, and enables a much better covering afterwards."—*On Gun-shot Wounds, p. 204.*

In military surgery, flap-operations of the thigh is often advantageous, because all the flesh on one side of the limb is frequently torn away, as well as sometimes a muscled state as to be such for making a covering for the end of the bone. Here a flap, sufficient to cover the whole face of the stump, should be saved from the sound flesh on the other side of the limb. When the surgeon cannot the flap-operations, not from necessity, as in the case last mentioned, and the limb is saved at least the member, the best way is to save a flap on each side of the limb, by making two semicircular cuts, the extremities of which extend to a parallel manner forward, and the terminations of

which meet at the upper end some distance of the limb. The great point to be at all times attended to is, however, which are to be made obliquely upwards, such as the base of the flap on each side. However, though this is the best plan, particular cases may require a flap to be made from the anterior, or even the posterior side of the thigh. The latter method should never be followed but from necessity.—*See Guy's Pract. Obs. in Surgery, p. 221, ed. 2.*

According to Mr. Guthrie, the difference between the flap-operation at the upper part of the thigh and that at the hip, consists in its being done lower down, and in the flaps being saved more extensively from the external and internal sides of the thigh, the inner flap being the largest, in order to prevent the most numerous which might arise from the external covering, being stretched over the end of the bone. For the same reason Mr. Guthrie also recommends the bone to be saved off close to the lower trochanter, even when the cause of the injury would allow of its being left on its neck longer.—*On Gun-shot Wounds, p. 200.*

Flap-operations of the thigh, after the manner of Verduin, is now preferred by Klein, one of the best operating surgeons in Germany, and by Messrs. Joubert and Syms, two surgeons of great merit at Edinburgh.—*See Brit. Med. and Surg. Journ. vol. 14, p. 36–45, &c.* It is also sometimes preferred in several of the metropolitan hospitals. Of seven cases which Klein adopted this method, the greater number were healed in ten days, and the rest in three weeks; and this success, accompanied with an injury always to practice it. After this mode he finds there is no danger of the muscles retracting themselves, and losing the end of the bone protruding, even though the patient be transported from one place to another. With respect to the common difficulty of making up the stump six weeks, Klein admits this objection, but thinks that it equally applies to Verduin's method. He says, great stress is to be made of giving due support to the flaps with compresses and a roller.—*See Practische Anatomie des menschlichen chirurgischen Operations, p. 25–26, &c. Stuttgart, 1816.*

In one instance, where a ball had broken the upper part of the femur, and disarticulation had spread so far towards the great trochanter and buttock, that it was impossible to operate except by the flap-operation, or by taking the head of the bone out of the joint, Klein made a broad flap six inches long at the inner and upper part of the thigh, and then he cut the soft parts straight across just below the great trochanter, so as to make one wound meet the termination of the incision by which the inner flap was raised. This patient got perfectly well in three weeks.—*Op. cit. p. 29.* and so did another very similar case, operated upon by the same method.—*P. 32.* Where the bleeding is considerable, the femoral artery and perhaps should be tied previously to saving the bone; but if the vessels are well compressed by the pressure the sewing might be best completed.

At the middle of the thigh, Desault also prefers amputating with two lateral flaps; pressure is made on the internal artery as it passes over the trunk of the pelvis; and the vessel is tied immediately the same flap is formed. Desault makes the flaps with a very long narrow two-pointed band, which he introduces through the limb on each side, and then runs obliquely outwards, and downwards with it; but I think Mr. Syms is right in recommending the mode used by Mr. Joubert, and the lack of which is that it does not except for an inch from the point.—*Ed. Med. Surg. Journ. vol. 14, p. 37.* Mr. Joubert also preferred a knife with a broad back, but the wounds should be cut with it in a way that would render the syringing of them troublesome.

AMPUTATION BELOW THE KNEE.

In treating of amputation of the thigh I have remarked that at least half of the work as possible should be preserved. The longer it is after the operation, the stronger and more useful will it be found. But when the leg is to be amputated, the surgeon commonly says the operation is to be performed a little way below the knee, even though the cause for which the limb is removed may be situated in the foot or ankle, and would allow the operation to be done much farther down. The common practice is to make the incision through the ligaments, not low enough to enable the operator to save the bone, about four inches below the lowest part of the patella.

About six inches below this point is generally an eligible place for the first circular cut through the skin. This degree of firmness is usually deemed necessary, in order not to impair the energy of that power of motion which arises from the flexor tendons of the leg containing tendons. It is alleged also as a reason for this mode of proceeding, that it is quite sufficient to preserve a few inches of the leg in order to afford the body a proper surface of support in walking with a wooden leg; whereas, if a larger portion was saved, the superfluous part would be a great inconvenience both in walking and sitting down, without being of the smallest utility in any respect whatever. However, as I shall presently notice, experience proves that where, according to these notions, an injury or disease would dictate the performance of amputation about the knee, the prospect of amputating below that joint, but much higher than is presently sanctioned, may be followed with advantage.

The instrument should be applied to the femoral artery about two-thirds of the way down the thigh, just before the knee, performing the bend of the triangle round. This place is much more convenient than the knee, where it is very difficult to compress the vessel against the bone. The patient is to be placed upon a firm table, as in the operation of the neck, and the leg being properly held by one assistant, while the assistants are drawn up round to another, the surgeon with one quick stroke of the knife is to make a circular incision through the integuments all round the limb. Some recommend the operator to stand on the inside of the leg, in order that he may be able to see both bones at once. No reflections could ever make me perceive that any real advantage could strictly be supposed in this plan. Many suppose that it diminishes the chance of the flaps being splintered, this now being completely denied rather sooner than the flaps. But splintering the bones generally arises from the assistant compressing the limb too much, or else not supporting it enough. If the assistant were to be guilty of this mismanagement, it would be difficult to explain why the skin should not be splintered instead of the flaps, when a certain thickness of it had been almost through. At the same time it must be admitted, that if the surgeon prefer standing on the inside of the limb, there is no objection to that at the time of making the saw; but before this period, in amputating the right leg, there is great convenience in having the left hand next to the wound, as is the case when the surgeon stands on the outside of the right limb. Hence I have seen many happy hospital surgeons, in amputating the right leg, cut the soft parts while they stood on the outside of the limb, and having done that part of the operation they proceeded to the other side of the member for the purpose of applying the saw. I have only to repeat, that I do not think any particular reason exists against having the two bones exposed, yet in such manner as to let the flaps be divided entirely through the first; and the advantage of doing this lies against the time by the presence of the hands of the assistants, while the surgeon is sawing it, to either disarticulate whilst infection a great deal; whilst to compress the lower flap. Grafe, who is already mentioned, prefers the first operation, does not think it advisable for the surgeon to stand on the inside of the limb in his method of operation; because, when the knife is introduced through the muscles of the calf, its point would be upon the bone of the two bones.—(Nomenclature de la Chir. Générale, Glosse, p. 124.)

A circular cut being made through the integuments about two inches below the place where it is intended to saw the bone, the next object is to preserve skin enough to cover the front of the limb, and the part of the stump corresponding to the situation of the flaps distant, exterior ligament, pedicle, and other apertures, between the skin and muscle, and these covering the latter bone. Throughout this extent there are six leafy branches which can be made very serviceable in preventing the end of the stump, and consequently the operator must take care to preserve sufficient skin in this situation by dissecting it from the parts beneath and turning it up.

On the back part of the leg, on the contrary, the skin should never be needlessly detached to a great extent from the large gastrocnemius muscle, which, with the apertures, will keep from a sufficient material covering the stump. However, the operation which I said by the

army taught me the truth of a remark made by Grafe, that in forming the posterior flap of muscle it is a matter of the highest importance to let the integuments be somewhat looser than it is, for otherwise, when it is turned downwards, as it must be for the purpose of covering the ends of the bones, no point edge will be left discovered by integuments which, being the extent, describe a greater circumference than the deeper muscular flap.—(Nomenclature de la Chir. Générale, Glosse, p. 124.) I was fully convinced of the truth of this observation by two operations which were done by myself one in the neighbourhood of Amberg, in 1814, and the other at Brussels the day after the battle of Waterloo. Yet I wish, who performs the first operation, strictly called (that is to say, the operation in which a flap of skin corresponding in size to the flap of muscle is preserved, does not himself touch the skin from the muscles of the calf at all, but at the time of making the incision in that situation directs one assistant to pull up the integuments, while another holds the end as much as possible, which assistants have the effect of lifting the muscles be cut rather deeper than the skin. Unfortunately, however, in many cases, the very nature of the disease, or injury for which the operation is performed, would not admit of these proceedings. Now, in a very numerous class, would they be likely to suffice, as Grafe himself confesses, since in such cases the resistance to the use of a knife, but laterally for the purpose of separating, as it were, as the flaps are made, the thick muscular flap.—(Op. cit. p. 124.) In the ordinary method with the circular incision, I am disposed to think it best, therefore, to let a small quantity of skin be detached and saved at the back part of the leg, so that there may be a satisfactory covering enough to cover with the extremity of the divided tendons of the calf. As soon as the skin has been separated in front and on the outside of the leg, the surgeon is to detach the skin from the calf for about an inch, and having methoded as shown this prepared portion at the way, he is to place the edge of the knife close to the edge of the reflected or reflected skin in the back of the limb, and cut obliquely upwards through the muscles of the calf, from the inner edge of the skin vein across the flaps, exposing the operator to be on the outside of the right leg, and that it is this position which is undergoing approval. In performing this last incision, as M. Louis well observes, it is essential to incline the edge of the knife obliquely upwards. In this manner the skin will be longer than the muscles, and the wire considerably accelerated.—(Mém. de l'Acad. de Chir. t. 2, vol. 1, p. 124.)

In the leg, the necessity of dissecting the skin from the muscular parts is acknowledged to be greater than in the thigh, thus Mr. Guthrie says,—"as the attachment of the skin to the bone will be nearly above of its reflection, it must be dissected back as usual, and separated from the bone, the division of which in the first incision would reveal nothing, does its strong attachment to the parts beneath."—(On Gunshot Wounds, p. 250.) In dissecting the skin, however, a much greater dissection of it should be made at the foot and outer part of the limb, than at the opposite points, as already explained.

The day formed of the integuments and muscles of the calf is then to be laid back by one of the assistants, while the assistant completes the division of the rest of the muscles, together with that of the gastrocnemius ligament, by means of the scalpel, a kind of long, narrow, double-edged knife.

In separating below the knee, very particular care must be taken to preserve the tendons of the muscles of the leg, which are in such. Every part except the bone being divided, the soft parts are next to be preserved from the back of the wire by a great retractor, and with two wire to move the two bones, and being taken to let the small part be applied to the flaps of the calf, as particularly advised by Grafe.—(Op. cit. p. 126.)

In the leg there are only three principal arteries requiring ligatures, viz. the anterior and posterior tibial, and the peroneal or fibular arteries. In dividing all these, however, the surgeon is sometimes obliged to be very cautious. The anterior tibial artery will be found in front of the interosseous space, and between the curves of the bones; the fibular artery behind the tibia; and the posterior tibial artery more inwardly than the last among the fibres of

the vessels, under the skin.—C. Bell, *Oper. Surgery*, vol. 1, p. 245.

When the soft parts have been cut in the preceding way, the flaps are raised, and the artery and vein are to be closed by bringing the flap of skin over the front and external parts of the stump, so as to form the flap composed of the gastroepiploic, splanchnic, and inferior vasa on the opposite side.—This should be done without lifting any tight strait of plaster from the skin against the stump edge of the flap; a strait and harmful pressure, which has often occasioned absorption and sloughing of the integument, and pressure and necrosis of the bone. It is this strait which leads Mr. Gosselin to prefer closing the wound vertically, or merely so, and applying the adhesive straps there side to side.—On *Gosselin's Wounds*, p. 221. I think, however, that the above mode of operating almost necessarily requires the wound to be closed, when it first falls, especially in a direction from the thigh to the knee. But where a great deal of skin is saved at round the limb, and the vessels of the calf are not closely infarcted upon the covering the bone, the perpendicular line of the wound will answer very well.

Many surgeons, however, operate differently. They first make the external incision through the skin, two inches below where they intend to save the bone. They then detach the skin from the muscles and bones equally all round the limb to the extent of about a couple of inches. The integument is then turned up, and a division of the tissues made all round down to the bone, as a level with the line where the detachment of the skin has terminated. The parts between the bones are afterward cut through, &c. The hemorrhage having been stopped, the arguments are drawn down over the stump, and the line of the wound made perpendicular.

In the stump, the practice has sometimes been adopted of sewing off the sharp upper edge of the thigh, but I can offer no exact judgment on the merits of this operation, which has made but slow progress. It has been done a few times at St. Bartholomew's, and I should have no objection to giving it a fair trial, especially as it lies the suggestion of Mr. Gosselin, who says, that in such cases, where the edge of the bone is very sharp, this part should be removed with the saw.—*J. 221.*

Occasionally surgeons have also removed the small segment of the tibia, and such was sometimes the practice of Larrey, when he amputated below the knee three centuries.—*Mém. de Chir. Mil. t. 3, p. 261.*

Whether the above plan of amputating the leg so high up, when the foot or ankle is the part diseased or injured, be on the whole most advantageous, I cannot pretend to determine. By some other men the practice has been recommended; and though too much pursued by the best surgeons in this metropolis, and my own sentiments incline me to believe they are right, I will not say that the sufferer is so seduced as not to require further consideration.

Mr. White of Manchester, in a paper dated 1790 (*Med. Obs. and Inq.* vol. 4), informs us that he lost the limb by amputating a little above the ankle, from seeing a case in which the limb had been cut by a blade instrument, with such success that the patient could walk extremely well, though with a machine that was very badly constructed. After this, Mr. White began to operate above the ankle with the double caution; and he invented a machine (which better calculated for the patient to walk upon).

In 1773, Mr. Brunsford published his *Chartered Cases and Observations*, wherein he mentions the following case. The year 1750 he amputated above the ankle, in a case of gangrene of this part of the leg. The patient walked so well, with the aid of a very simple machine, both along a level surface, and in going up and down stairs, that it was difficult to persuade him that he was lame. Mr. Brunsford was persuaded, however, to give up this practice, and he treated then in 1754, a Mr. Wright had three amputations in this way with success, when he again had recourse to it within the next year or two.—*See Chir. Cases and Obs.* vol. 1, p. 264, &c.

The advantage of amputating a little below the knee is, that the pressure in walking with a wooden leg is entirely confined to the front of the limb, the stumps itself are being subjected to rotation. After amputating at the ankle, the pressure in walking operates di-

rectly on the osseous. According to Bistrot, this plan has been extensively used in France, but not found to answer, the stump being incapable of bearing pressure, and not continuing healed.—*20e Année (Mémoires)*, t. 2, p. 277, 684, &c. Baron Larrey also speaks of it as an essential operation, not merely because some patients, as he himself observes, have not the means of providing themselves with artificial legs of the above description, but because it is almost always followed by bad symptoms, owing to the small quantity of cellular substance and flesh, and the thickness of the bone at this part of the leg, whereby distention is produced. A nervous irritation is necessary to be produced by this than the common mode of amputating, and the suppuration, which is always present, takes place with difficulty.—*I have* says Larrey, seen many amputations done at this part, but nearly all the patients died of various fever at St. Louis.—*Mém. de Chir. Mil.* t. 3, p. 293.

In the foregoing essays I have given some account of the dissection of the leg, as done by Lott, Larrey, Verdin, Gosselin, Verdin, and others, and, as before, the practice of Gosselin has been treated upon, whose chief peculiarity, viz. that of not laying down the flap until two or three days had elapsed, was unquestionably the greatest error, though the idea may have been adopted and followed by a few spectators in modern times.—*See Ponsard, Opusc.* de Chir. p. 736, &c. Paris, 1865. This last author, who is a general advocate of flap-amputations, leaves the stump untouched for some days after the removal of the bone, but it surprised me to hear, that in one of the most hospitals in this metropolis, three or four levels were made a few years ago, of a modification of this absurd practice, after amputation by the modern system. Instead of bringing the sides of the wound together, the flaps were only partially closed, and kept for a day or two covered with wet linen. The last patient whom I heard of as having been treated in this manner, died a few days after the operation; and it gives me pleasure to hear, that all further intention of subjecting more patients to the experiment, in the hospital alluded to, is given up.

In flap-amputations below the knee, Larrey and Lucas conceived that the cure might be rendered more safe, easy, and expeditious by applying the thigh with the view of raising it by the first incision.

The following case explains Mr. Larrey's flap-amputations. The disease was in the left leg, the patient, therefore, lay on his right side, upon a table of convenient height, so as to turn the part to be first cut, fully into view. The intended line, where the limb was to pass in forming the flap, had been previously marked out with ink. A longitudinal incision was made with a common scalpel, about the middle of the side of the leg; and on the outside, then on the inside, and across the tendo Achillis; above, the intended flap was formed, first by reflecting through the skin and adipose membrane, and then completed by passing a cutting through the muscular parts in the upper incised part, and afterward carrying it out below, in the direction of the line already mentioned. The flap was thick, compressing the whole substance of the tendo Achillis. The usual double incision was made; the osseous applied to defend the soft parts; and the bone divided as high as possible with the saw.

The flap was placed in contact with the naked stump, and retained there at first by three exponential stitches, between which adhesive plasters were used. Notwithstanding the patient might at first move after a few days afterward, the stump healed in three weeks, except only in the case of the tendo Achillis, where the protruded part had healed. In order to keep the use of a splint, a spongy substance, about the size of a split pea. This being treated with creosote, heated in a few days. The man was soon able to use an artificial leg, with which he walked regularly well. He went several voyages to sea, and did not interfere with great activity. He bore the pressure of the machine readily upon the end of the stump, and was not troubled with the first irritation or venous.

In the next instance, in which Mr. Larrey operated, he turned the flap by passing a double-edged knife through the leg, and passing it downwards, and then upwards, in a line first marked out before direction of the knife. In this way, the flap was more thickly made.

The leg should be completely extended during the operation, and kept in that position till the wound is perfectly healed.

We shall next notice Mr. Hey's method. He was satisfied, that very soon the whole must be the most proper place for this kind of amputation.

Some cases occurring in which, from a syphilis held, the wound at the stump would not heal completely, yet remain healed, Mr. Hey determined to try whether amputation in a more vascular part would not secure a complete healing, and give the patient an opportunity of resting his knee to the maximum wooden leg, or being a soldier, as he might find most convenient. Mr. Hey formerly preferred this method, while he related to certain cases.

It had been distinctly at the Leeds Infirmary, to make the head of the flap extend to one third of the circumference of the leg. This was determined by the eye of the operator, who usually picked the circular through the leg just the posterior part of the fibula. Mr. Hey, finding the flap was not always of the proper breadth, began to determine this by tapestry, and then operated as follows: to ascertain the place where the bones are to be saved, together with the length and breadth of the flap, he draws upon the limb five lines, three circular and two longitudinal ones. He first measures the length of the leg from the highest part of the tibia to the middle of the inferior prominence of the fibula. At the midpoint between the knee and ankle, he makes the first or highest circular mark upon the leg. How the bones are to be saved. Here Mr. Hey also measures the circumference of the leg, and divides the length and breadth of the flap, each of which is to be equal to one third of the circumference. In measuring the circumference of the limb Mr. Hey employs a strip of twisted tape or thread, and places one end of it on the front edge of the tibia. Supposing the circumference to be twelve inches, he makes a dot at the circular mark on each side of the leg, four inches from the anterior edge of the tibia. These dots, next, of course, he four inches apart behind. From each of these dots Mr. Hey draws a straight line downwards, four inches in length, and parallel to the front edge of the tibia. These lines show the direction which the cutting is to take in making the flap. At the termination of these lines, Mr. Hey makes a second mark, round the limb, to show the place where the flap is to end. Lastly, a third circular mark he makes four inches below the upper one, first made for the purpose of directing the circular cut through the integuments in front of the limb. The cutting he makes the flap should be longer than three commonly employed in amputations.

Mr. Hey uses one which is seven inches long in the tibia, and makes at the back, to avoid making any longitudinal wound of the arteries, which is very difficult to close with a ligature; and for the same reason, he passes the cutting through the leg a little below the place where such vessels are to be divided as are not included in the flap. The limb being nearly horizontal, and the fibula upwards, he passes the cutting through the leg where the dot was made, and carries it downwards along the longitudinal mark, till it approaches the lower circular mark, a little below which the integuments is brought on. The flap being held back, Mr. Hey throws the integuments in the front of the limb along the course of the second circular mark. Two incisions not included in the flap are then divided a little below the place where the bones are to be saved. No great quantity of these incisions can be saved, not is it necessary, as the flap contains a sufficient portion of the gastrocnemius and soleus muscles to make it suitable for the work of the bones. After saving the bones, Mr. Hey divides a little of the end of the head of the gastrocnemius to be cut off, so it is apt to project beyond the skin when the flap is put down, and he accommodates the large crural nerve, when found in the inner surface of the flap, to be dissected out, but it should suffer compression.

As cases of adhesive phlegm cause great pressure on the end of the stump, Mr. Hey prefers having for keeping the flap applied, small strips of cast plaster being put between the flaps. The stump may be cut out on the eighth or ninth day, and the flap supported by plasters.

Mr. C. Bell describes another sort of flap-amputation. The operation is not to be done so low, as there will

not be a sufficiency of muscles to cover the end of the bone. An oblique cut is to be made with the large amputating knife upwards, through the skin of the back part of the leg. The pressure is to draw up the skin, and the knife is to be again applied to the upper margin of the wound, and carried obliquely upwards till it reaches the bones. The knife, without being wholly drawn, is next to be carried in a circular direction over the tibia and fibula, severing the entire muscles until it reaches the middle of the first incision on the outside of the limb. The stump is then to present the following appearance. The nerves being compressed, and the arteries severed, the flap is to be laid down, and the integuments of the two sides of the wound will be found to meet.—*Operative Surgery*, vol. i, 4. A complete dissection of the part of passing the knife through the calf of the leg, as practised by Alcock, Hey, Keilich, Langer, Lauffer, Sykes, &c., because an inexperienced surgeon may cut the point between the two bones, and in this way the wound is never made evenly. The reason of having the flap flatter is similar to Mr. C. Bell's, except that he first passes the knife in the integuments, two longitudinal and one transverse, by which the shape of the flap of skin is determined.—*Med. Jurid. Cur.* 5, 1, p. 371.

The regular flap-amputation of the leg, I mean that operation in which the circular incision is abandoned, and a semicircular flap both of skin and muscle preserved, is often considered more painful than the flaps method. Yet when we come to see what respectable authors are recorded in its favour, little more the advantage is made, how well the ends of the limbs are covered, and how all dissection of the integuments from the fascia is avoided in this mode of operating, at least as far as the flap extends, the method again is almost all positive and well recommended. Indeed, in its present improved state, and with the positive blessing of such a strong recommendation, this operation, I think is again rather rising in the estimation of the profession. In 1820, I first had performed this operation of the leg about twenty times. If the flap should happen to be more too large, its particular effects on the propriety of removing part of it at once; and when it is too short, he suggests carrying the incision a little further upwards without delay. He confesses that the flap is attended with some little trouble in securing the interosseous arteries, which are apt to bleed considerably; but such has been the success of his practice, that out of twenty cases sometimes got well, and most of them very soon, without the least suppuration; and the other three died of typhus.—*Précis des Anecdotes des Evidences* Chir. Op. low (lett. p. 47). In the same work, this experienced surgeon, confessed how much more quickly and certainly the treated limbs after amputations with two flaps, than those with one, had suggested a plan of amputating below the knee, so as to form two lateral flaps. Mr. Syme, of Edinburgh, recommends an anterior and a posterior flap. On the other hand, as already mentioned, it is only in amputation below the knee that Dr. Bailey considers the circular incision decidedly preferable to the flap-operation. He distinctly declares, that he "never saw a case where a flap was turned from the calf of the leg, in which considerable refluxion of the remaining muscles did not occur, attended with great suppuration of the flap, separation of its edge from the skin on the front of the tibia, sometimes exfoliation of the bone, and generally tedious suppuration." His words are in French, in favour of the method recommended by Mr. Hey, viz. that of forming an anterior and posterior flap; for before I saw his paper, I were performed this operation, and regret to say that my success was so indifferent, that I have not since repeated it.—*Lancet*, No. 245, p. 208. I have also tried the same method, and coincide with Dr. Bailey respecting it.

The principal reasons have already been specified which have established the recovery of cases of amputating the leg above the knee below the knee, and if the disease or injury will not admit of the operation being done thus low, of drawing the limb above the knee-point. In the Egyptian campaign, however, Baron Larrey performed two amputations very near the knee-point, almost as a level with the head of the fibula, which he judged proper to amputate. The successful result of these operations disposed of the fear which this experienced surgeon previously expressed about am-

putting is the $\frac{1}{16}$ th part of the upper head of the tibia; for no portion of this spongy portion of the bone has had effect on the knee-joint, and no tenderness of the stump ensued; and, with the difference of a few days, the wound healed so readily as that made in the common place of amputation, viz. three or four finger-breadths below the tuberosity of the tibia. Above the above-mentioned variegation, Larrey has supposed this practice to apply only when it was impossible to have operated at the usual place, and he assumes to, the effects fully equalled what attends operations done at the ordinary distance from the knee. In 1800, another French military surgeon, who had tried this method himself, published a dissertation, in which the recommended operation, when circumstances required it, much higher than the point allowed by general principles. Larrey differs, however, from Deschamps, in forbidding amputation higher than the level of the tuberosity of the tibia; the thick portion of muscle may be saved, but not above the insertion of the tendon of the patella. A transverse line, drawn from this point, certainly passes lower the articulation of the tibia, and over the lower portion of the upper part of the condyles of the femur; but as the relative position of the heads of the two bones to each other differs somewhat in different individuals, Larrey makes the tuberosity of the tibia the point above which the bone should never be saved. By cutting higher, the ligament of the patella is separated from its insertion. The femur, moreover, situated underneath it, is exposed, and the ligament of the knee of the joint are injured; whence arise contraction of the patella, effusion of the synovia, and such diseases of the knee-joint as may render further amputation indispensable. By making the division at a level with the tuberosity of the tibia, the attachment of the ligament of the patella is preserved as well as that of the lower condyles of the femur, which are requisite for the motion of the thigh. The bone is thus left unexposed; and the head of the knee is saved less liable to swell, creating a risk of fever. But, says Larrey, if this mode of amputating below the knee be compared with amputation of the thigh, as recommended by authors for the case in which the joint is diseased, the advantages of the latter are considerable. In the first place, life is less endangered, because a smaller portion of the limb is removed. The operation is as easy at one situation as the other. The patient lies with equal facility. Larrey has never seen the spurious part of the limb become cancerous, nor perceptibly exfoliate. When the remaining portion of the thigh is very short, as usually happens, it is best to be taken away, as it is a useless body; inconvenient for the employment of a wooden leg. Larrey directs as much skin as possible to be preserved, and stating a perpendicular incision through that part of it which covers the tibia, in order to hinder the bone from making its way through it by absorption.

With a strong line firmly, compressing the bone and one or two finger-breadths of the leg, the patient lies a few points of support, on which he can securely walk without a stick. The stump admits also of an artificial leg of the natural shape being worn, the knee being always bent, provided the length of the stump do not exceed the diameter of the calf of the amputated limb. — *Mém. de Chir. Militaire*, t. 5, p. 388—394. From a passage quoted by Mr. Guthrie, it would seem that Mr. Bransford (Chir. Obs. and Cases, vol. 1, p. 185, advised amputating as near to the knee as could be done, without risk of exposing the ligament of the patella so that the stump might not extend beyond the swollen leg. On the whole, Mr. Guthrie's own observations are very favourable to this position; but he cautiously acknowledges his belief, that "it would not succeed when successfully done in the hospitals of large cities." Owing it may frequently be perceived in one army, with advantage, provided the stump saw enough the tibia below its tuberosity. — *On Gunshot Wounds*, p. 221 and 227. Upon looking over the details of the cases recorded by Larrey in confirmation of the above statement, I was struck with one important fact, which does not justify a part of his conclusions; viz. most of the stumps were about four months in healing; and that which healed more quickly was not well below the sixty-eighth day. — See *Mém. de Chir. Mil.* t. 5, p. 37, 38, 39, &c. Hence, unless it be supposed that the wounds produced by amputation below the knee in the ordinary manner are generally

thus long in healing, as treated by the French surgeons, the inference is rather unfavourable to the method so highly recommended by Larrey, though I am far from wishing to assert that, even if the stumps cannot usually be healed by less time, more than a fair compensation for this disadvantage is not obtained by any of the benefits above enumerated. However, in order to be able to pronounce any positive judgment on the merits of this mode of operating, it would be necessary not only to see two or three successful cases, but after their cure, but to examine the state of a tubercle remaining of stumps some time after they had been subjected to the pressure of an artificial leg.

ARTICULARITY OF THE ARM.

The structure of the arm is very analogous to that of the thigh; likewise, it contains only one bone, round which the muscles are arranged. The anterior muscles are attached to the os brachii, while the two superficial ones extend along the limb, without being at all adherent. The first vessel of the brachial artery, and the two short heads of the triceps; the second of the brachio and long head of the triceps. Hence amputation is best to be done in the same way as in the thigh, unless when we are recommended to amputate very high up above the insertion of the deltoid muscle. In the arm, says Guthrie, the incisions through the muscles should even be made more obliquely upwards than in the thigh, where the muscles are more bulky, by which might two inches of muscle may be saved, besides the remaining integuments; an amputation for covering the stump, were the skin still in position is indispensable. — *Norman for the Art. of Amputating*, p. 109.

The patient lying properly supported, the arm is to be raised from the side, and if the shoulder will allow it, into a horizontal position. As I have seen some ingenious persons professing as the patient's sharing in the motion of the operation, I put Guthrie and some other practitioners at thinking that the patient, if circumstances will allow, should be placed upon a table in the operation position. — *Norman for the Art. of Amputating*, p. 109. The strongest is to stand on the inside of the limb, apply the tourniquet as high as possible, and let the skin and muscles, which he is about to divide, be made tense by the hands of an assistant. The joint parts are next to be divided, as much of the limb being preserved as possible. The tourniquet is to be applied, the bone saved with the least possible loss, and the bleeding stopped in the ordinary way, care being taken to leave the joint, the rest of the ligature, which wound round the brachial artery. The wound is then to be closed so as to form a transverse line, the dressings are to be applied, and the patient put to bed with the wound a little elevated from the surface of the bleeding.

In tying off the arm, I entirely coincide with Mr. Guthrie with regard to the usefulness of dissecting back the artery, and, in consequence, a pain long ago removed by the celebrated Hagerstrom, their efficient attraction by an assistant after their complete division being quite enough. — *On Gunshot Wounds*, p. 204; but, as I have constantly retained Guthrie and others, in making the incisions through the muscles with the edge of the knife turned very obliquely upwards, it has not appeared to me necessary, after cutting down to the bone in this manner, to clear away the soft parts from it to the extent of an inch and a half or two inches higher. Instead also of attempting to perform the circular oblique incision through the muscles with our stroke of the knife, the obliquity to which have been noticed in the oblique or amputation of the thigh, I have made it a rule to divide the huge biceps muscle as soon as the integuments have been cut and removed, and of tying it fully round before the division of the rest of the soft parts is begun.

If the shoulder should require the arm to be taken off at its upper part, there would be no room for the application of the tourniquet. Here, instead of putting a compress in the axilla, and having it bent freely upon the axillary by a splinter, as advised by Sabatier, it is more eligible to make pressure on the artery as it passes over the first rib, of which method I shall speak in tracing the operation at the shoulder-joint. With a straight incision the surgeon is to make a transverse incision down to the bone, a little above the lower extremity of the deltoid muscle. Two other incisions, increasing

made along the front and back edge of this muscle, now form a flap, which is then detached, and reflected. Lastly, the end of the soft parts of the limb are to be divided by a circular incision made on a level with the base of the flap, and the operation finished like a common amputation.—*Neuberg, Midwifery Operations*, t. 2, p. 373, &c. ed. 2.

As a matter of choice, and not at all of necessity, the arm may be amputated with two flaps, one anterior, the other posterior. The first should be formed of the skin and muscle, and be three or four inches in length; the other is to be of the same size, and composed of the muscle and integuments. The muscular flesh close to the bone is now to be divided all round, and the arm freed. When preferred due to the common method, and adopted in most cases, the vein is the end of the bone always covered, that a portion of it is impossible.—*Practische Anweisung zur Chirurgischen Operationen*, p. 46.

When the arm is injured very high up, Baron Larrey gives an account of the following plan to preserve a clean stump, maintaining the upper end of the humerus; but, says he, if this bone cannot be divided at least on a level with the tendons (insertion of the deltoid), the stump is extended towards the ligament on the posterior margin and inserted there; the ligament on the muscle towards the humeral process of scapula; joint pain and nervous twinges, often ending in tetanus, are prevented; the stump refuses to heal; and, in the end, the limb is fixed by adhesions to the shoulder, so that this portion of the arm remains altogether useless, and renders the patient liable to accidents. "I have seen (says Larrey) many officers and soldiers, who on these accounts, were very glad they had not undergone amputations at the shoulder."—(*Mém. de Chir. Mil.* t. 2, p. 52, 403.)

Mr. Goulin also states, that when amputation by the circular incision is attempted at the insertion of the pectoralis major, the bone will generally protrude after a few days. However, he entirely disavows from Larrey respecting the necessity of making at the last, at the shoulder, and perfects using it from half an inch to an inch and a half below the insertion of the humerus, in the state of the injury may require. Two incisions are to commence, one of two finger-breadths below the axillary; and the other one it is to be extended directly across the outer side of the limb, till it meets the lower point of the other wound. "Then the outer part of the arm is cut by a circular incision; the upper in the same manner as it sometimes is in removing the limb at the shoulder-joint. Without detaching the skin from the muscles there are cut through. The soft parts are held out of the way of the knife; the bone is sawed; the vessels secured; and the flaps brought together, so as to form a flap from the axillary (continued).—(*Practische Anweisung*, p. 337, 403.) I am sensible of opinion, that, in the description of cases referred to, either this method, or Sabatier's operation should be preferred to the removal of the whole limb at the shoulder-joint.

Dupuytren sometimes amputates at the elbow joint, but as the stump is not much useful, then when the operation is done a little higher up, and the wound is frequently long in healing, the method appears hardly to merit a description.

AMPUTATION OF THE FOREARM.

The wrist usually, with respect to the place for making the incision, is to cut off at least of the limb as possible. This fact is perfectly established, though it is true that Larrey, in consequence of his mode of dressing the stump, has not experienced success in his amputations done in the middle part of the forearm. The forearm is to be held by two assistants, one of whom is to take hold of the elbow, the other at the wrist. The tourniquet is to be applied to the lower part of the arm, and the assistant holding the arm should draw up the integuments, so as to make them taut. The circular incision is then to be made down to the fascia; from there no more skin is to be detached, reflected, and turned, as is necessary for exposing the ends of the bones, and the muscles are to be cut on a level with the reflected skin, the limbs being at the same time drawn slightly upwards. As many of the muscles are deeply situated beneath the outer bones of the forearm, too much attention must be paid to dis-

secting all of them, with a double-edged knife, into dorsal between the radius and ulna.

The soft parts are to be preserved from the saw by a flesh extensor. It is generally recommended to saw the two bones together, for which purpose the instrument should be placed in the utmost state of position. As the radius of the lower part of the forearm is longer than the ulna, it should perhaps be sawed through first, the latter bone, in consequence of its connection with the humerus, being better adapted to bear the weight of the arm.—(*Avicenna Op. Chirurgia*, p. 124.)

The inner, radial, and two intermediate arteries are those which usually require a ligature.

Goulin reflects the forearm by making a flap from the third to fourth of the limb, and then extending the wound across the middle.—*Neuberg* (in *Practische Anweisung chirurgische Operationen*, p. 378, &c. the Berlin, 1814.) Mr. Goulin makes two flaps, one in front, the other on the back of the forearm; but, above the middle of this part of the limb, he prefers the circular incision.—(*Op. Chirurg. Wundst.* p. 334, 374.) Dr. Brown also expresses the opinion of separating the tendons, so as to make two separate flaps (*Principles of Military Surgery*, p. 203, ed. 3.) which is the method recommended and pursued by Goulin.—(*Practische Anweisung chirurgische Operationen*, Heft 1, p. 52.) Larrey also operates in this way in the lower third of the forearm. These flaps, instead of the forearm, are rather proceeded at choice than of necessity; for I have seen this part of the limb removed in almost all instances by the circular incision, and can hardly remember a case in which the sawy flaps were badly. In making the lower flap, the radius and ulna are not necessarily in danger of being wounded higher up than the point where they are quite cut through, as Mr. Goulin readily acknowledges; an accident which I think might give rise to a great deal of trouble.

With respect to Larrey's preference in amputating in the fleshy part of the forearm, though the real would admit of the operation being done much lower, I need only say, he would find no reason for this choice were he to practice again by the first incision at every opportunity, as is the custom in England.

The hand may be separated at the joint of the wrist whenever the disease does not extend too high, and a flap can be made of the integuments of the back of the hand. Informed thinks such an operation sometimes preferable to amputation above the joint.—(*Neuberg, Chirurg.* t. 2, p. 360, ed. 4.) Evidence seems the flap from the palm. The circumstances of the case should of course judiciously determine the choice. The amputation may also be done by the circular incision.

AMPUTATION AT THE ELBOW JOINT.

The very idea of this formidable operation has a long while checked the hand even of the most ready advocate for the use of the amputating knife, and every mind shuddered at so extensive a mutilation. Still, it could not be denied, that the chance of saving life occasionally depended upon a submission to the greatest temporary suffering, and that without the most rapid of amputations, the preservation of the patient was totally impossible. Doubtless an amputation at the hip appeared, both as respect to the magnitude of the part of the body to be removed, and the extent of the wound caused by such removal, the most formidable nature of amputation at length began to induce surgeons to view more dispassionately a scheme, at which the mind at first naturally recoiled.—Mention is the earliest practitioners who made this severe operation the subject of anatomical question (*Opusculum de Chir.* t. 1, p. 178, 179, 180, &c.) and in the year 1779, two essays on the same topic were communicated to the Royal Academy of Surgery at Paris, by two of its pupils, Voisin and Pottier. In 1782, Ravaton resolved to have performed an amputation at the elbow-joint in a case of gun-shot fracture of the humerus, radius, and neck of the ulna-bone, but was prevented by the opposition of other surgeons.—(*Flat. d'Anat.* p. 355, &c.) In 1785, the propriety of amputating the operation was urged by Alauzet.—(*Ann. Chir. Hist.* t. 2, p. 302.) At length, the Royal Academy of Surgery at Paris thought the subject highly deserving of further investigation, so it appointed a series of its members, that there were circumstances under which its performance might be advisable. In the year 1790, they therefore proposed the following

question, as the great point subject; in the case in which amputation of the hip-joint should appear to be the only resource for saving the patient's life, no determination whether the operation ought to be practised, and what would be the best way of performing it? No satisfactory decision having been arrived at, the same subject was proposed in 1793. The application of the Ankyer was now confined on a paper written by Barthe, in which the propriety of amputating at the hip-joint was defended, and some of the cases demanding the operation specified. If, for instance, a cancerous, or any other indolent tumour arose, had earned off or crushed the thigh, so as to leave only a few joints to be cut in making the necessary amputation, he thought a surgeon might not so hesitating about doing it. The same author considered that a sphacelus, extending to the circumference of the joint, and destroying the greatest part of the surrounding flesh, might also render the operation equally necessary and easy.—*Mémoires de l'Académie de Médecine*, t. 2, p. 271, &c. Cases were also adduced, where the surgeon completed the amputation of the dead parts with a knife. However, this cannot be considered as amputation of the hip-joint. Resolving a few dead tissues was a thing of no importance, in regard to the likelihood of its creating any bad symptoms. The proceeding, in fact, seems to me to have no analogy at all to the ordinary operation of taking the thigh-bone out of the socket. It is quite a different thing, where the operator has to cut through parts which bleed profusely, and are endowed with life and sensibility.

In addition to the remarks by Barthe, thirty-three other essays were added to the collection, the majority of which were filled with arguments in favour of the operation; and, besides these productions, two other memoirs were published at Paris, one by Guérinard in 1798, expounding a new method of operating, and another by Mouton (see *Ann. de Médecine*, in 1799), in which, says Professor Thomson, the operation is very aptly considered in all its different particulars.—*Atlas made in the Mil. Hospital in Belgium*, p. 699—700.

Some of the best surgeons of the last and present century condemn the proceeding. The following are Mr. Pott's sentiments: "M. Blandin and M. Tison are the only people whom I have met with or heard of who profess, who speak of an amputation in the joint as being an advisable thing, or as being preferable to the same operation in the thigh." After a discussion is two, he continues: "that amputation in the joint of the hip is not an impermissible operation, although it is a dreadful one! Every well-know, I cannot say that I have ever done it, but I have seen it done, and am now very sure I shall never do it, unless it be for a dead body." The parallel which is drawn between the operation and that in the shoulder will not hold. In the latter it sometimes happens, that the disease is confined to the head of the femur, and that the capsule is perfectly sound and unviolated. In the case of a carious hip-joint, this never is the fact; the surrounding vessels, and parts about, are always more or less in the same state, or at least in a disordered one, and an infected mass frequently runs the parts within the pelvis, &c.—*Pott on Amputation*.—How it may be remarked, that Pott was right, inasmuch as the operation is hardly supportable any more of the hip-joint, but wrong in not perceiving, that, ought still to vary alone, it might be proper for others. Callisen had difficulty in supporting any circumstances in which the operation should be undertaken with hopes of success.—*Ann. Chir. Hist.* p. 115, t. 3, 1845, 1846. And Richardson thinks, that indeed the task is nearly equalled by the disease at accident, a previous attempt should always making the attempt.—*Newcomb*, &c., p. 101, ed. 4.

It is a remarkable fact in the history of surgery, that an operation which had been invented in France, and gradually worked up to such had been written in that country, should have been first actually put in practice in England. It has been advanced (says Professor Thomson), that the operation was performed in London by the late Mr. H. Thomson, surgeon to the London Hospital, and that he had first been here his operations to which Mr. Pott alludes.—*Atlas made in the Mil. Hospital in Belgium*, p. 704. At all events, whether this was the original case which Mr. Pott saw or not, the example referred to by this distinguished surgeon is the earliest instance of the opera-

tion being actually performed. It was even repeated in two countries before it was ever practised on the continent, as far as can be made out from the records of the profession; for it was performed by Mr. Ross, of Northampton, upon a girl between eleven and twelve years of age, in a case of diseased hip; a case in which I am now considerably satisfied that it ought never to be attempted, for the reason laid down by Mr. Pott. In fact, Mr. Ross, after removing the head, found the acetabulum, and all the adjacent parts of the osseous structure, cancerous. But the experiment was here rendered still more hopeless by the patient being consumptive. Yet with all these disadvantages, the girl lived till the eighteenth day from the operation, and after death her lungs were found to be a complete mass of disease, one of them being totally reduced to matter.—*See Thomson's Med. Communications*, vol. 6, p. 247, 2vo. Lond. 1798. Larrey performed this operation twice in Egypt; and once while he was serving with the French army on the Rhine. He was encouraged to make these attempts to give his patients by the consideration that he had already preserved some lives by separating either both thighs, both legs, or both arms, or removing the humerus at the shoulder-joint. Larrey has also the true merit of having first done the operation, in the only description of cases in which perhaps (with the exception of bad examples of nervous or the highest part of the femur) it might ever be performed; viz. granulated pyrexia of the head, neck, and upper part of the breast, with or without injury of the femoral artery, or where the limb had been cut first away by a shell or cannon-ball, too high up to admit of amputation in the ordinary manner.—However, he also regards as fit occasions for amputation at the hip-joint circumstances in which, from gunshot violence, the first is seized or threatened with gangrene nearly up to the hip.—*Mémoires de Chir.* Mil. t. 6, p. 185.

Seeing as the operation is, Larrey contends that it is an act of humanity, if it ever in the course of saving lives which are in danger, and to argue that it is justifiable by the old maxim of Hippocrates, "Ad extremam morbois curam remedia." To the chief objections which have been made to it, he replies, 1st. That the wound is more alarming than dangerous. The Cassean operation (says he) has been successfully performed on the living femur, and is still recommended by many practitioners. 2d. As to the principal source of the disease (Hospital), has successfully removed a suppuration every of considerable size. Examples are recorded of the arm and supple being torn away, and the patients soon recovering. Besides, the supple has it in his power to lessen the wound produced by the operation. 3dly. The dangers of locomotion may be obviated by the assistants temporarily placing their fingers on the femur of the cut vessels, with ligatures can be applied.

In confirmation of his sentiments concerning the propriety of the operation, Larrey adverts to a fact reported by Marsini, where a soldier had both his legs amputated very high up, and who both his arms to near the shoulders that he could hold nothing in his hands. Yet, notwithstanding he was, he enjoyed good health.—*Opuscules de Chir.* p. 145. And Larrey, in his own work has recorded several instances in which the whole of a limb was removed, or more than the halves of both the upper or lower extremities of the same subject, without any fatal constitutional disturbance.—*Mémoires de Chir.* Mil. t. 2, p. 178—181. One of his patients above alluded to survived the operation a week, at the end of which he was carried off by the phlegm; and the others died, after being convalescent in a very happy manner, during the previous march of recovery.—*See Relations de l'Hôpital de l'Armée d'Orient en Egypte*, &c. p. 320, 3vo. Paris, 1801. At the battle of Wagram, Larrey operated at the hip-joint on two soldiers of the imperial guard, under very disadvantageous circumstances; and the wounds were healed in a few hours.—*Mémoires de Chir.* Mil. t. 2, p. 314.

Larrey lived to operate as follows: he began with making an incision in the neck of the original artery in the head of the groin, and after carefully dividing the nerve, which is now, externally situated, he tied the vessel, with the use of a semicircular curved needle, as closely as possible to Pott's ligament, in order that the ligament, which was placed above the origin of the circumflex artery and the profunda, might remove all interference from the bleeding

which might otherwise happen from such numerous lesions. This being done, a straight knife was perpendicularly placed between the tendons of the muscles attached to the tracheal anastomosis and the bone of the neck of the femur, so as to bring into its point at the back part of the limb, or in a diametrically opposite situation to its first extremity; and now, by drawing the knife obliquely upwards and downwards, a flap, which was not to be too large, was made of the soft parts of the inner and upper portion of the limb. This flap was now drawn towards the acetabulum by an assistant, and the articulation was brought into view. The vascular artery, and some branches of the venous field, necessary for making the flap, were immediately tied. The thigh was now put into the state of abduction; the inner part of the articular ligament was freed from its position, was divided, and the joint exposed. The ligamentum pectus was then cut, and the bone disarticulated. The knife was now brought to the outside of the great trochanter, and an external flap formed of the soft parts, equivalent to most that might have been made at the neck of the limb. In proceeding through the operation, Larrey secured, as soon as they were divided, the obturator arteries, and several branches of the profunda, gluteal, and ischiatic arteries. The two flaps were brought together and kept in this position with strips of adhesive plaster, and a suitable dress bandaged.—See *Mém. de Chir. M. E. V.* p. 146–148.

In the Russian campaign, Larrey had two more opportunities of operating at the hip-joint. In the first instance he operated upon a Russian at Witepsk, whose thigh-bone was broken to pieces by the tracheal anastomosis, and the soft parts of considerable thickness of the limb destroyed. This man was as favourable as possible until the 23d day from the operation, the parts being healed except at two points where the ligaments had been lacerated; but, unfortunately, a quantity of puriform matter declared from some neglect or mistake; and the patient on the 26th day fell a victim. The second operation was done on a French dragoon, at the battle of Moscow, who was afterwards soon perfectly cured by the same operation at Orléans, who received his wound, and made a report of the fact to Larrey himself.—See *Mém. de Chir. M. E. V.* p. 25–26, 31, 32, Paris, 1817.

In 1815, M. Botta, surgeon to the Hôpital des Enfants Malades at Paris, amputated at the hip-joint in the manner of Larrey, except that he only exposed the artery at the groin, and did not begin with tying it, a method to which Larrey himself now gives the preference.—See *Mém. de Chir. M. E. V.* p. 431. The patient was a child seven years old, and the case a diseased hip. The patient got well of the wound, but died of scurvy three months afterward. The cavity was found full of fungus flesh, and the os pubis was carious. As the latter was always exposed in the diseased hip-joint, the whole of the disease did not admit of removal by amputation, and consequently the strongest advice never to do again.—See *Journal, Dissection* &c.

The plan of operating adopted by Botta is corrected, I believe, by all surgeons of the present day, better than that formerly adopted by Larrey, inasmuch as the os pubis and unnecessary preliminary exposure of taking up the artery in the groin, instead of simply compressing it against the os pubis, was omitted. Coming down to the artery as a preliminary operation for exposure, is doing a useless operation, and putting the patient to needless suffering; it was the earliest method, having been proposed by Volkmann and Pott, who was the first proposer to, prove the artery against the os pubis, instead of cutting down to the vessel. I am not at present aware, and I never find it has been publicly recommended by Mr. Abernethy, in his various published lectures, for the last thirty years; it is a silly-two years ago I began to attend his course, and in the celebration of this operation, by the vascular method upon the dead subject, compression of the artery in the groin was then advised, and so I have used, not far from first class. Likewise it is said to compress articulation at the hip-joint upon the dead subject is not so common: the following is his method, as described by a military writer.—The patient of the patient lying on the edge of the table, and the limb being supported by an assistant, the operator places a line at such an angle, from the anterior and superior spaces between of the

bones straight down the thigh. From this point he carries another towards the knee, at right angles, so as to form a right angle. On the outer extremity of the last he places the point of a long pointed cutting, and pushes it perpendicularly downwards till it strikes against the head of the femur. Then passing it on the outer side of the bone, he makes a circular ligament of about an inch from the margin of the bone. He now cuts and draws, for an inch or two, in order to clear the great trochanter, and draws the external flap, now of five inches in length, by cutting down the line between the trochanters and bone. The femoral artery, which may now be seen, is in its compressed position between the fingers and thumb of an assistant, while the operator thrusts the knife in, and will at the same point as before, but carrying it on the inner side of the head of the bone, he forms a smaller flap on that side of the artery. He then, with the point of his knife, goes through the vascular ligament, divides the bone, and removes the limb by drawing the round ligament, &c.—See *Abernethy's Operative Surgery*, Lond. 1807, p. 151, &c.; also *Manuel, Méth. Op. vétér.*, vol. Paris, 1822. It is likewise said Mr. Pott, that as late as the present century some surgeons, and long since by the French, he will not injure the femoral artery, which cannot be divided till the bone is removed downwards. This is a great experience referred by Larrey in his operations; for before the surgeon cuts the artery, the assistant can amputate the limb into the bone and compress the vessel.

The disarticulation is accomplished as follows: the surgeon, holding the limb with his left hand, while the assistant holds steady the flap, makes a cut half an inch beyond the articulation of the bone-joint. The limb is then put in the position of abduction, the bone placed from the socket, the knife is carried round the bone, and the triangular and other remains of the capsule ligament are divided.—See *Ed. Med. Surg. Journ.* Nov. 18, p. 41.

A very similar method of operating was followed by Professor Van Walther.—See *Chir. and Walther's Journ.* Also *Andersson's Quarterly Journ.* vol. 1, p. 62.

This method was followed by Mr. Syme in the very interesting case in which he lately operated at the hip-joint for an extensive necrosis of the femur, where the neck of the bone was itself diseased. Unfortunately, when the wound was nearly healed, the patient became delirious, and died, at the beginning of the eighth week from the period when the limb was taken off.—*Op. cit.* p. 52.

Langebeck began the first incision on the outside of the femoral artery, and forms the external flap by extending the wound towards the tuberosity of the ischium. The knee is then inclined towards, and the head of the femur disarticulated, after which the limb is moved to the inside of the thigh, and the inner flap made.—*Ed. Med. Surg. Journ.* 1, p. 4, p. 52.

When conversant with the artery in Holland in 1804, I missed the line Mr. Cole in his performance of this operation. The plan adopted by him is the same as that which has been taught by Mr. Abernethy in his lectures, for more than thirty years. The flow of blood through the femoral artery was stopped by compressing the vessel in the groin with the handle of a key covered with lard. The thigh was then compressed as high as possible, above the tracheal anastomosis. The femoral artery was immediately secured, and afterward every other vessel requiring ligature. An incision was now made directly on the os pubis, and the head of the bone removed with the utmost facility and expedition. The patient had even less blood than in any ordinary amputation, and the wound required of being brought together with adhesive plaster in the best manner possible; so as to represent a transverse scar. I am sorry to add, that the patient lived only till the following day. In an *anecdote* case of fracture of the upper part of the femur by a grape-shot, where the operation had been delayed too long, the whole limb being surrounded with matter, and the upper end of the bone projecting through the back of the neck, I ventured to perform the same operation at Oudenhoorn in Holland, a few days after the month of August of 1800; and here happened what had often occurred; immediately the soft parts had been divided, as the bone was broken to pieces, the limb came off, leaving the head of the bone, the tracheal anastomosis, and

A small piece below them projecting. Had not the man appeared in a very bad way by the time the vein had been secured, I should now have removed the head of the bone; but the shock of the operation was such that he survived it but a few minutes, though scarcely any blood was lost. The result of operating by the anterior incision is preferred by Gosselin, who unknowingly considers it as a new method.—*Nature* for Dec. 13th, 1865, p. 115. It has also been proposed by Mr. Velin, with the modification of having an inch or two of the bone projected, which is done without giving any additional pain, by dissecting off the soft parts below the first incision drawn in the line. This projecting piece is intended to serve as a lever, with which the head of the bone is to be got out of the canal.—*Edinb. Med. and Surg. Journ.* vol. 2, p. 105. I especially wish to mention that I do not regard it as an important practical improvement; 1st, because in almost all cases, where the operation is necessary, the bone is so fractured that it divides in a steady mode by the injury; 2dly, because the scheme is unnecessary; 3dly, as Dr. Davis's case, where I assumed, the head of the bone was fractured from the articulation with the osseous tibia by merely making an incision over that point, cutting the ligaments, and drawing upwards of the small piece of bone immediately projecting. In fact, it is a pure scientific, requiring this operation, occupying a few minutes of spreading exposure from wounds, the bone is usually broken too high for Mr. Velin's method to be practicable. With the same view of facilitating the exit of the head of the bone from the canal, Gosselin, p. 117, recommends dividing the transverse ligament which completes the basis of the violence and inferior side of the socket. From my having once used one of the first antiseptics in London, with a powerful pain-reducer, and the whole length of the anterior incision for a lever, sufficed for nearly half an hour before I could dislocate the head of the bone, I suppose Gosselin's system worth mentioning.

Mr. Ashley Cooper suggested the operation by making an incision just above the patellar ligament, a little on the outside of the femoral artery. The wound was then carried obliquely down towards and outwards to the back of the thigh, about an inch of the way down it, from which point the knife was turned in the opposite direction, obliquely upwards and inwards to meet the first incision, so as to form an elliptical curve. The femoral artery, being now divided, was immediately tied. The muscles were next cut through, another artery wound, and the bone taken out of its socket. Only about twelve cubits of blood were lost.—*See Lancet*, vol. 2, p. 10, &c.

The following method is recommended by Mr. Scott, 1861. The patient was to lie on the opposite side of the body to that on which the operation is to be done. The femoral artery is to be compressed. The surgeon, standing behind the limb, is to put the thumb in the flexor of his left hand on the great trochanter. With the right he introduces the point of the knife perpendicularly over this process, and then depressing the handle, carries the incision forwards and upwards near the patella below the groin. He then curves the knife round the limb, cutting as deeply as possible, and bringing the knife at length up to the point from which the wound commenced. All the muscular fibres are fully divided by this first incision; still below the limb must generally be worked again, not the first stage of the operation can be completed.

For the purpose of getting at the vessels, the sides of the wound must be kept apart, and any transverse fibres not yet cut, be divided. As soon as it is performed, it is to be cut through perpendicularly on the head of the femur. The limb is now to be raised, the femur, and the bone divided, whereby the head of the bone is forced nearly out of its socket, and quite it completely as soon as the round ligament is cut, which is the easy part by which it is cut. The operation then raises the thigh bone, so as to make its head project, after which he cuts the rest of the capsule and transverse fibres, and completes the operation of the limb. When the operation is not the left side, the surgeon stands in front of the limb.—*See Bonald, in Methods Medicales, ou Nouvelle Methode pour amputer dans les articulations*, Paris, 1817, &c.

The variety in the mode of operating is now very considerable. Were I to offer a particular description

of every method, my limits would be greatly exceeded. It may suffice, therefore, to refer to Gosselin's *Journal* for an account of the plan which he adopted on the living subject; and though the case had not a fortunate result, the operation itself was very skillfully performed.

Several cases are now recorded, in which amputation at the hip-joint proved successful. The first was that under the care of Mr. Bowditch, attended to the same, on the 10th of December, 1811. The upper part of the thigh bone had been broken by a gun-shot near Meville, in Spain, the 22nd of December, 1811. Some time ago, the man was living at Spalding, in Lincolnshire, in perfect health.

The second successful operation was that performed by Larrey, at Wittepsk.

The third was done by Mr. Guistrie, in the *Nouvelles Annales* on a French prisoner of war, who completely recovered. This third is the example in which Mr. Ashley Cooper anticipated in the hip an account of a disease of the higher part of the femur. As the patient had formerly suffered amputation of the thigh, it was certainly not the sudden removal of every a quarter of him; but I cannot promise to say, any difference in the character of the process, and whether any result is connected with the circumstances.

In June, 1821, amputation at the hip was done by Professor Dieffenbach, at Nottmiller, on account of a tumor of the femur, and the patient was completely well in the following September.—*See Review Medical*. The operation was also performed by Dr. May, at New York, on the 7th of October, 1821, and the wound of the wound had healed by the 20th of November. This case was a bad fracture of the upper part of the femur, followed by abscess and disease of the bone.—*See Philadelphia Journal*, No. 9, vol. 3, New Series. The patient's age was favorable, as he was a boy of only ten years of age. At this period of life, the chances of recovery will always be greater than in adults, not only in consequence of the remedial power of nature being then prepotently great, but on account of the smaller dimensions of the vessel necessary for the purpose of the operation.

The following details of this case may prove serviceable to the profession, by showing that the operation may be advantageously attempted in a patient who would otherwise have speedily sunk under his disease. It is moreover interesting from the circumstance of its being the first instance in which it was ever successfully performed, and the first amputation at the hip-joint in this country.

George Bayle, a healthy boy, ten years old, broke his thigh about two days of its length from the hip-joint; two days after, sprains and bandages were freely and judiciously applied, which produced great distress, and were removed at the suggestion of the boy. Phlebotomy modification of Bonald's spirit was prepared by the physician then called in, who joined out to the father, previous to his amputation, a projecting point on the outside of the thigh, which was the extremity of the superior ligament, which by the improper pressure was nearly forced through the integuments. The bone being properly exposed, the long spirit was then applied.

About three weeks subsequent to this period another physician was called in, who recommended the employment of the inflated plexus, which was adopted, the bundle forming it having rests at the side. The boy stated that during his confinement in this inflated plexus for several weeks, he had an insupportable itching about, exposed the thigh on the inside just above the cord, which produced a situation requiring looking to the dislocated bone. If present pusillitas, however, that the skin was dried and peeling when it was struck against the pet and spread.

He was brought into the city of New York on the 7th of September, 1821, at which time we first saw him. His countenance was expressive of much anguish with a white tongue and loose pulse; his right limb was much enlarged on the outside, denoting a case of acute aneurysm. Some time it was hard and ungiving, was exceedingly tender, and when pressed gave excruciating pain. The swelling extended to the great trochanter, gradually diminishing towards the top of the thigh. Opposite to the greatest enlargement was a sinus, discharging a thin mucous fluid, leading to the middle of the thigh bone, which was perfectly carious.

During two weeks preceding his arrival in the city, medicines were administered with a view of allaying irritation, and improving him to the extent, his health and night sweats, notwithstanding, improved. As hemorrhages began to occur by the use of the ligatures, and all the symptoms became more, it was resolved to attempt at the ligatures as the only chance of saving the life of the patient.

On the 17th of October, 1861, the patient, after having passed a comfortable night, was placed upon the table of steel to be operated on. An incision was made over the femoral artery as it emerges from under the femoral arch, and the vessel secured by ligatures. While lying on the outside of the artery for the lower coarctation, the patient lost a vessel apparently not much smaller than the femoral artery immediately below the incision, continued as that in this case, the profunda femoris was given off above the femoral arch, as we occasionally find it. This vessel was taken up.

Ligature's ends were then introduced between the artery and bone, and carried through close by the back of the artery towards the tibial arch, thus forming the inner flap. The external flap was raised by pulling from without inwards. The hemorrhage from the veins and small arteries was considerable when the incisions were made, and arteries and veins were taken up; but comparatively little blood was lost during the operation, and the patient was put to bed shortly after it was completed. After the inner flap was cut, some of the vaginal abundance, expressing the lower trochanter, protruded from the head of the bone was not disengaged. In order to satisfy the doubts expressed, the bone was exposed through the lower trochanter, when it was found to be of the consequence of disease, being detached of portions on the outer side by towards the joint, and requiring to be removed, which was afterward done, as originally contemplated.

It is entirely necessary for us to enter into the detail of symptoms and treatment subsequent to the operation, as nothing occurred worthy of note, except various degrees of irritation of the stomach and water system, previous to the closing away of the ligatures. The treatment consisted in regulating the diet, and administering anodyne and tonic medicines according to circumstances.

On the 17th of October, eight days from the operation, two-thirds of the stump was healed by the first intention. Between the 17th and 21st of October, all the ligatures, according to custom, were removed; and by the 23rd of November the whole stump was effectually healed, and the boy had become fat and hearty. There can be no doubt but that this limb might have been saved without difficulty, had the proper treatment been instituted when the accident occurred. When it came under our charge, nothing short of the operation above related could have saved the boy's life.—*Amos.*

Another successful amputation at the hip was performed by Mr. Green; the disease commenced in the knee; but terminated in extensive disease of the thigh-bone, large abscesses, and dislocation of the knee, the leg being fixed in the bent position, and drawn under the thigh.—*See Med. Chir. Trans. vol. 12, p. 685.*

On the other hand, the failure of this operation are innumerable, through misadventure by surprise of operation and ability. Mr. Gifford, Dr. Keary, Mr. Brownrigg, Barnes, Larrey, Walther, Gosselin, Mr. Beale, Mr. Charabiel (Trans. of the Assoc. Physicians, vol. 2, p. 185), and many other military practitioners, have had opportunities of attempting at the hip without success.

A caution has been made, that out of twenty attempted hip-joint amputations, six have had a favorable termination.—*Chelius, Fland. der Chir. b. 2, p. 162.* According to my observations, this account is rather too favorable.

No one can expect, however, this operation not to fail in a large proportion of the cases in which it is attempted; that must always happen, let it be done in the most skillful manner possible. Yet, as there are unquestionably some descriptions of injury, where life must be inevitably lost, if this proceeding be rejected, and experience proves that it sometimes succeeds, an important consideration is what cases are most proper for it. Here I am decidedly of opinion with Professor Thompson, that the operation is valuable in penetrating either gas, and when no other means

be suffered, are those in which the head or neck of the thigh-bone has been fractured by a gunshot ball, grasp, shot, or small piece of steel. Eight or ten such cases, where amputation could be done less than in the first instance, were brought in Vienna several days after the accident to Rouppey-op-Zoon, from the hospital was performed by myself at Quakenbush, and not one of these patients lived ten days after their amputation. In the single case of my personal care, I have never observed it succeed so much suffering, or suppuration as with profusion. From each limb, I should guess, that at least three or four joints, if matter were discharged daily. But amputation at the hip has been performed at first, some of these patients might possibly have been saved, at all events, I am certain that it was their only chance.

Larrey, as I have stated, thinks the operation proper, where the thigh has been shot off high up, or where the femur and soft parts near the hip have been broken, and extensively lacerated by a cannon-ball or piece of shell. Hence the operation, though perhaps the only chance, must almost always fail, because, as Professor Thompson observes, these injuries occasion a shock to the constitution, of which the patient mostly swells either immediately, or in a few hours.—*Amos, made at the Med. Hosp. in Belgium, p. 174.* The result of this observation I have corroborated at Mendenham, near Antwerp, at the headquarters of the French fleet in that port; a shell burst between the thigh of one of the guards; tore and lacerated two-thirds of the thickness of the upper part of the right thigh, broke the ascending ramus of the ischium; lacerated the perineum and scrotum; and fractured the higher part of the femur. There was no hemorrhage of consequence; but the exposed lacerated surface of the soft parts was immense, and the unfortunate soldier, who lay with his limbs standing erect, and bent of his intellectual faculties, sunk in the course of a quarter of an hour into a state of insensibility, and ten minutes dead in twenty minutes. However, there are some cases in which the patient, after dreadful laceration of the upper part of the thigh, are less depressed and overcome, and live several weeks; these strongly proving that the operation might be attempted. Many instances of this kind are related by Mr. Gifford.—*See Gun-shot Wounds, p. 128, &c.* Had and irreparable disease of the upper part of the thigh (the scapular hip, not any other example at which the pelvis is affected, may also require the performance of amputation at the hip-joint, as was recently illustrated in the practice of Mr. Home, of Edinburgh, and in that of Sir Astley Cooper. The case in which Mr. Carmichael attempted at the hip, was what we termed as osteomyelitis; the patient, a girl 16 years of age, died on the 15th day.—*See Trans. of the King's and Queen's College of Physicians, Ireland, vol. 2, p. 257, &c. and Vol. 2, p. 128.* Dr. Nott's case, already referred to, was one of fracture of the upper part of the femur, leading to disease of the bone and extensive abscesses. The disease, for which DePorch operated, was caries of the thigh-bone. The progress of the operation in desperate cases is now perfectly established.

ANATOMY OF THE SHOULDER-JOINT.

R. P. Le Drac performed the first operation of this kind, of which the particulars are recorded. It was in a case of cancer and necrosis, resulting from the middle in the neck of the humerus. Le Drac began with rendering himself master of the bleeding, for which purpose he introduced a straight needle and a strong ligature under the artery. This was passed from the front to the back part of the arm as closely to the axilla and bone as possible. The ligature then, including the vessels, the flesh surrounding them, and the skin carrying them, was tightened over a compress. Le Drac, with a straight narrow knife, then made a transverse incision through the skin and deltoid muscle down to the joint, and through the ligament surrounding the head of the humerus. An assistant now raised the arm and dislocated the head of the bone from the cavity of the socket. This allowed the bone to be raised with ease between the bone and the flesh. Le Drac then carried the bone downwards, keeping its edge always somewhat turned towards the bone. In the manner he gradually cut through all the parts, as he lay a little below the ligature. As there was a large flap, Le Drac made a second ligature with a curved

blood, which ligature included a great deal of flesh, the peduncular portion of which was cut off together with the first ligature, which had become useless.—*Obs. de Chir. 1. 3. p. 215. Paris 1781; and Traité de Chir. p. 265.*—*La Faye* (the son), who performed this remarkable case, does not state that the operation was a new one, and it appears from the *Recherches Cliniques* sur l'Anesthésie, &c. de la Chirurgie de France, and from *La Faye's* notes on *Hist. nat.* that it had been previously performed by *Morand*, the father.

Garengeot observes that the ligature might be applied by means of a curved needle, with sharp point; and in order to lessen the wound, he directs the insertion of ligatures at three finger-breadths below the incision, across the distal tendon, so as to form one flap; then a second one was made in the arsis; and after the second ligature had been applied, the two flaps were brought into contact.—*Traité de Chir. 1. 2. p. 232; Mém. de Acad. de Chir. 1. 2. p. 961.*

La Faye extended the incision one finger further. After placing the patient in a chair, and bringing the arm in a horizontal position, he applied, with a common bistoury, a trifurcate incision into the distal tendon, about a line below the elbow, four finger-breadths before the incision. Two other incisions, one in front, the other behind, descended perpendicularly to this first, and made a large flap of the figure of a T, which was then detached and turned up towards the top of the shoulder. The two ends of the incision, the remains of the superficial integuments, were pinned and well secured, and the capillary ligament, which was first divided. Now when the muscular wall had the lower part of the first flap, the last described flap turned up a lever of the bone, the head of the bone was easily dislocated. *La Faye* next carried the incision downwards, about the inner part of the arm, until he was able to feel the vessels, which he tied as near the axilla as possible. The separation of the limb was then completed a finger-breadth below the ligature. The flap was then brought down over the glenoid cavity, and the wound closed.—*Obs. Neurolog. Méthode pour faire l'opération de l'Amputation dans l'Amputation du Bras avec l'Omoplate*, par M. *La Faye*, in *Mém. de l'Acad. de Chir. 1. 2. p. 193, 180.* With respect to *La Faye's* method, it is useless to make a comparison between him and *Larrey*; the latter, though generally accused, is the author of nothing strange by the first intention, is an advocate for this practice after long and repeated operations, as *La Faye*, who was fearful of laying down the flap after amputation of the leg, had no such apprehensions at the shoulder.

La Faye's method as yet regarded as one of the worst appeared when the state of the soft parts well suited it. But it is almost to think of applying any one plan to all the various states in which the injured or diseased limb may present itself. It is advised by *Larrey* himself, when a wound extends through the upper part of the arm, breaking the bone, and exposing the soft parts. Here, says he, it would be impossible to force an anastomosis and a powerful flap, for the soft parts in these situations have been destroyed. On the contrary, when the distal is short, *La Faye's* plan is inadvisable.—*M. de Chir. 1. 2. p. 971.*

The advantages of *La Faye's* plan are obvious. As only one ligature was applied, the patient was saved a great deal of pain; the flap connected with the arm, was capable of covering the whole surface of the wound, and was more easily applied and kept on the stump than the covering of the two flaps which *Garengeot* recommended; and the discharge went a ready issue downwards.

Mr. S. Wilson recommended the following plan: "The patient was lying flat horizontally, make an incision through the connective adipose, from the upper part of the shoulder across the humeral tendon down to the arsis; then turning the limb with its edge upwards, divide the muscle and part of the tendon, all which may be done without danger of wounding the great vessels, which will become exposed by these incisions. If they be not cut with ease of the distal muscle, and carry the arm backwards. Then, with a strong ligature, having tied the artery and vein, pin the muscles together through the joint, and carefully divide the vessels at a considerable distance below the ligature; the other small vessels are to be secured, as in other cases."

* In doing this operation, regard should be had to the

artery as much as possible, and to the situation of the processes anastomotic, which, projecting considerably beyond the joint, an ordinary operator would be apt to cut upon.—*Observations of Surgery.*

Brookfield used to press the artery against the first ap. The member begins at the lower of the arm by the edge of the distal tendon, as high up as where the processes pass over the axilla in its insertion into the humerus. Passing through the anastomosis and vessels, he continued his incision obliquely downwards and outwards, as far as a little below the insertion of the distal tendon. Then, coming up the humerus transversely for a small space, he continued dividing the wound was next extended to the external part of the arm as high as the spot of the anastomosis in the axilla. The flap thus shaped, which raised from the humerus, was intended to fill up the axilla, after the removal of the limb. *Brookfield's* axilla incision began at the anastomosis, and being carried through the vein and arterial cord to the bone, terminated in the semicircular incision above described, and it was so guided that it left the outer portion of the divided flap larger than the inner one. Hypothetical then passed his knife under the lower edge of the internal half flap, and dissected it up as far as possible. The border of the posterior muscle was thus exposed, under which he now passed his left forefinger, which, acted as a retractor, is a protected external boundary. With this he now divided the attachment of that muscle to the humerus. If the vessels were not now sufficiently brought into view, he cut through the outer end of the humerus, and tied them artery and vein each with two strong ligatures about half an inch apart. The vessels were then cut through in the interspace, and the nerve was divided much higher than the artery. The external flap was now raised sufficiently to expose the joint; and the nerves and capillary ligament having been cut through in the upper and lateral parts, the humerus slipped out of the glenoid cavity, and the whole of the arm was carried a little backwards. Lastly, the ligatures and vessels being held out of the way, the soft parts towards the axilla were divided in a semicircular direction.—*Chir. Obs. and Cases*, vol. 1. p. 218–220, 1780. London, 1781.

The necessary inflexibility and easy fall, contrary to *Brookfield's* method have long constituted him a the approach of modern operators. The diameter of the flap into two portions, its extraordinary length, and the partial division practised to get at the artery, were among faults in the operation.

In 1778, *Almon* appeared at the shoulder-joint as follows: The subclavian artery was exposed by the fingers of an assistant. An incision was made about a finger's breadth below the anastomosis, and carried through the tendons all round the limb. The distal and posterior muscles were then obliquely divided up to the capillary ligament. The border of the incision and the capillary ligament upon the anterior and posterior part of the joint were now cut through. One of the circumflex arteries, which had a good deal, was tied. The great pedicle artery, the rest of the vessels, and all the other parts except the vessels and nerves were then divided, but previously in cutting the vessels a trifling ligature was put around them. Thus the separation of the limb was completed. The muscles of the vessels were drawn on and tied, and the temporary ligature taken away. Lastly, the sides of the wound were brought together, so as to make a transverse line. (Great, seemingly not to be neglected, as the operation by the circumflex vessels does not obliquely upwards had been practised by *Almon*, mentioned as a new proposition. It was done, after operating at the anastomosis, the patient was quite well in three weeks, and with his particular set of habits which he was, and which is much towards to point, he pretends to be able to make the oblique incision through the muscles all round the limb with ease every. Of course he is very careful to make pressure on the artery, both with *Mohr's* compression applied under the axilla, and the finger of an assistant above it.—*Obs. Neurolog. Méthode pour faire l'opération de l'Amputation du Bras avec l'Omoplate*, par M. *La Faye*, in *Mém. de l'Acad. de Chir. 1. 2. p. 193, 180.* In proof of the possibility of making the oblique incision quite easily with and without of his particular habit, he appeared a former subject, did the operation, and closed the wound to be drawn from all time.—*See Faye's* in *his Works*.)

In 1780, P. H. Dard published at Göttingen a description on amputation of the shoulder. In the first a

trousers were also detailed by Chalmers.—*Harley's Rep. Clin. &c.* 2, p. 754.

AMPUTATION OF THE WRIST OF A WOMAN.

In a letter to Mr. Pott, dated 17th, Mr. Park, surgeon to the Liverpool Hospital, made the proposal of totally amputating every diseased joint, by which the limbs might be preserved, with a share of motion that would suit a woman to be very useful.

Mr. Park's scheme, in short, was to remove entirely the extremities of all the bones, which form the distal joint, that is, the wrist, as much as possible of the regular ligament, and to divide a part by means of a saw, of the tendon of the flexor to the radius, when the operation was done on the right; and to perform in the same way on the left, when it was done on the elbow; so as to leave no more articulation in these situations.

In order to keep whether the postural vessels could be avoided without much difficulty in the exposure of the bone, Mr. Park made an experiment on the dead subject. An incision was made, beginning about two inches above the upper end of the radius, and extending about an inch below on ulnar part. Another cut was made within the articular ligament, immediately above the point, where in the bone, and finally half round the shaft, the ligament was all cut off. The lower angles formed by these incisions were bound up as far as they were the regular ligament; the tendons of the flexor were cut off; the upper angles were bound up, so as to form a dome; the head of the flexor, and a small swelling in the point of the posterior part of the bone, immediately above the articulation, were being taken to keep out of the fat pad of the point of the instrument (this done on the bone at the wrist). The cutting being withdrawn, an elastic bandage was introduced at its place, to guard the soft parts while the flexor was raised. The head of the bone, thus separated, was carefully dissected out; the head of the ulna was then with care raised up and saved off, and as much as possible of the regular ligament dissected away, leaving only the posterior part covering the vessels, which on examination had been in very little danger of being wounded.

The old artery was on the elbow; a single longitudinal incision was made from about two inches above to the same distance below the point of the dissection. The integuments having been raised, an incision was made to divide the lateral ligament, and to divide the joint; but this being found sufficient, the dissection was stopped off, after which the joint could be easily detached without any extensive incision, the lower extremity of the ulna having saved off, and preserved the bones of the radius and ulna. This appeared an easy work; but Mr. Park mentions the case well be difficult in a diseased state of the parts, and that a crucial ligament would be required, as well as dividing the tendons above the condyles, in this way done with respect to the distal bone.

Mr. Park first operated, July 5, 1798, on a strong robust man, aged 22, who had a diseased knee, of ten years standing. The painful sufferings were daily increasing, and his health declining. Mr. Park wished to avoid cutting the massive incision, thinking that, after cutting the parts, he could effect his object by the use of a small saw; but it was found that the difference between a healthy and diseased state of bone distressed him in this operation. Having by this way separated the joint, the transverse ligament made. The operation was finished exactly as the one on the dead subject before. The quantity of bone removed was very little more than two thirds of the bone, and rather more than two thirds of the shaft. The only artery divided was one of the from of the bone, and it ceased to bleed before the operation was completed, but the point of the bone still very freely. In order to keep the wound separate from putting ligatures, and the point of the vessels in a comfortable state, a few sutures were made. The dressings were kept and continued very much. The dressings were kept and continued very much. The dressings were kept and continued very much. The dressings were kept and continued very much.

During the recovery Mr. Park throughout the treatment. During the recovery Mr. Park throughout the treatment. During the recovery Mr. Park throughout the treatment. During the recovery Mr. Park throughout the treatment.

passage which formed. On the other hand, however, the first attempts were not at all successful. But the patient was obliged to keep his bed, and on the 10th he was moved, and it was every day better, and the pain was less. The next afternoon went to sea, and did his duty very well.

Subsequently to the publication of the letter to Mr. Pott, another section of the knee was done by Mr. Park, on the 10th of June, but the wound was almost healed, as the patient died on the 12th of October, and then died.

In 1802, P. F. Moreau presented to the French Academy of Surgery a memoir, proposing the removal of various parts. It only seems necessary to notice here the difference in Moreau's plan of separating from that adopted by our countrymen. Moreau, the son, who has published two accounts, observes, that the dissection of Moreau's operation, as two months every purpose; and to denote Mr. Park's direction to remove the ligament, if this be first from above, at least from below. Moreau never operated on the elbow as follows: with a drawing pin, he cut down to the sharp edge on the edge of the upper condyle of the ulna, about two inches above the articulation; and, directed by the eye, he carried the incision down to the point. He did the same on the other side, and then continued the two incisions by a transverse incision, which divided the skin and the tendon of the flexor, immediately above the articulation. The flap was elevated from the bone, and held out of the way by an assistant.

The flaps which adhered to the bone of the bone above the condyles was now separated, care being taken to divide the part of the instrument with the finger of the left hand, and when the handle of the scalpel could be placed through between the bone and the bone, Mr. Moreau directed it to remain there, and moved the bone through upon it. The removal of the part of bone was now finished, by detaching it from all its attachments. The removal of the bone of the radius and ulna remaining to be done, with other difficult, and the first flap being insufficient, it became necessary to make another. The lateral incision, at the outer side of the arm, was extended downwards, along the external border of the upper part of the radius. The head of the radius was separated from the surrounding parts; its connection with the ulna being cut, and a small piece was introduced between the bones, in order to keep the bone out of the way of the saw. The incision was placed through, near the insertion of the biceps, which was particularly preserved. Some remaining osseous parts, fixed with pins, were removed with a gouge. The ulna was now exposed, by separating the intermuscular on the inner side of the arm. Thus another flap was made, and detached from the back part of the forearm, and that portion of the bone which it was wished to remove. The bone being separated from every thing that adhered to it, and a strip of linen put round it to protect the flesh, about an inch and a half of it was saved off, measuring from the tip of the olecranon downwards. A few diseased osseous parts were taken away with the gouge. Two or three vessels were tied, and the flaps were brought together with sutures. In a fortnight this man became so well, that he was allowed to go wherever he pleased, with his arm supported in a case. The arm was at first painful, but it slowly recovered its strength, and the man could ultimately thrust arm and hold his plough with it, &c.

Seven months after another operation, performed in the same way as the preceding one, by Moreau the father, the patient was completely cured, and two years after this period the function of the forearm in the arm was very restored. In another case only the longitudinal incision and a transverse one were made, the flap being of considerable length. The patient got well in six weeks, and in three months was doing his regular work.

In all Moreau's cases, the flexion and extension of the forearm were preserved, which circumstance was highly depended very much on the insertion of the biceps not being destroyed. After the removal of the bone, however, the bones grew together.

Moreau gave a method of separating differed from his father's, inasmuch as the patient was in a supine position, and a sitting posture, and the os humeri moved before it was detached.

In a knee-case, Moreau the father operated as follows.—He made a longitudinal incision on each

sides of the thigh, between the vasti and the clunius of the leg, down to the knee. These incisions begin about two inches above the condyles of the femur, and were carried down along the sides of the bone till they reached the tibia. They were united by a transverse suture, which passed before the patella, down to the knee.

The skin was raised, but the patella retained in its being dissected, was dissected out. The skin was then laid, so as to bring the vessels of the femur into view. A line was drawn to cut them from the body of the bone before dissection there, every third adhering to their bed, where they joined the body of the bone, was separated as that piece like the fore-finger of the left hand was passed through in order to push back the skin from the bone while the saw was used. The bone having been laid, Moreau drew the cut piece to wards left, and easily detached it from the femoral ligament.

The head of the tibia was laid bare by an incision nearly vertical lines being made on the spine of that bone. The first lateral incision on the outer side of the knee was extended as far down as the head of the tibia. Thus were obtained two flaps which were laid to the flesh along by the interosseous space, and another incision the femur of the skin covering the inner surface of the tibia, which had been of necessity exposed before the saw could be applied.

Upon raising the outer flap, the head of the tibia was laid bare, and after being separated from its attachments was cut off with a small saw. The inner flap was then raised, and the head of the tibia having been separated from the patella, behind, was turned off.—(See Moreau's *Revue des progrès de la médecine* &c. in relation to amputations, *Annales de la Clinique*, Paris, &c.) Some physicians, however, in favour of the removal of diseased joints, have been published by Mr. Crumpton.—(*Dublin Hospital Reports*, vol. 4, p. 185, &c.) He has observed with success one knee and one elbow. Another amputator, only he is not known as a name, has twice having taken joints, and in which and otherwise having continued to the knee until the patient's death, three years and two months after the operation. Regarding the plan of operating on the knee he mentions that: "I am satisfied, from repeated trials on the dead subject, that the operation can be most safely and rapidly executed by separating the condyles from all their attachments previously to sawing the bone. As soon, therefore, as the flap containing the patella is turned upwards, the edge of the tibia should be carried round the condyles close to the bone, so as to divide all the ligaments which connect the femur with the tibia. The skin can then, with great ease be pushed backwards, and as much of the projecting vessels can be removed as the operator may think necessary."—(Vol. 4, p. 713.)

It does not appear necessary to insert in this work the account of cutting out the ankle-joint, an operation which will never be extensively adopted; nor shall I add any thing more concerning the mode of removing, in a similar way, the shoulder-joint. In treating of amputation in this volume I have already said enough, and whenever wishes for further information respecting this practice, must refer to Dr. Jeffray's work, entitled "*Notes of Experiments on the Joint*," Glasgow, 1804. This publication contains all that was then known on the subject. Dr. Jeffray has recommended a particular, and indeed a very ingenious, saw, for performing the above operation. The saw is fixed in a constructed wooden joint, like the chair of a wheel, so as to allow itself to be drawn through behind a bone, by means of a crooked handle, like a thread, and to cut the bone from behind forwards without dividing the soft parts. An experiment of this kind was executed in London by Mr. Richards, who was assisted in making it, by his disciples, the present Mr. Richards, of Bury-street. In placing the saw under a bone, its cutting edge is to be turned away from the bone. Blades are afterwards pushed to the instrument.

According to my notions of the treatment of diseased joints, nothing less than the patient's strength is an obstacle to the operation of the knee-joint. I am fully disposed to the propriety of preserving in an attempt to save the affected joint, Dr. Will's patient, greatly reduced by local symptoms, he also is removed from his bed and house as depends on the dissection of the whole of the knee-joint out of the limb? If some one should escape with life and limb preserved, would the bulk of

persons treated in this manner have the same good fortune? I cannot admit that the dissection of the whole of so large an articulation as the knee can be compared with the operation of amputation, in point of safety and utility. However, it is not on the difficulty of performing the former, that I would found my objections. As I believe that any man possessing a scientific knowledge of the anatomy of the joint might venture to perform the dissection. The principle on which I founded my opposition to the attempt to cut out large joints was the following:—1. The great length of time which the healing of the wound requires. Whenever I saw the case of Doctor N.Y. patient, well did that the operation was performed on the 2d of July, 1781, and that it was February 20th of the following year before all the violent fevers subsided and convalescence perfectly healed. This space of time is very greatly to be dreaded. Mr. Park describes the patient as delirious, restless, and gives no further particulars concerning the state of his constitution than that his health was declining. I venture little doubt, that if the operation of the knee had been performed in the usual healthy condition in which preparation for such a great operation, this case would not have afforded the illness arising from the operation. The only after case in which Mr. Park compared the knee joint dissection. In the operation related by Moreau there was, indeed, to be considerably added. This patient survived the first dangers consequent to an severe operation, and after three months' confinement, the patient was at such a state that Moreau observed he would be able to walk with crutches in another month or six weeks. The young man, in the same time, was attacked by an epidemic dysentery and died. On the 21st of October, 1782, Moreau occupied the knee-joint of a pregnant woman in the hospital at Grosvenor; but she died of labour on the 26th of the following February. He observes that the operation is much facilitated by removing the skin of the femur and tibia in their compound state.—(See *Ann. de la Clinique* &c. *Annales de la Clinique*, Paris, &c.) 2. Even supposing the extension of the knee to be followed by all possible success, is the advantage of having a quadruped, maimed, and half, in any other member, sufficiently great to induce any man to submit to an operation, beyond a doubt infinitely more dangerous than amputation? I think not. The practice is at present hardly included in this century; but I have every one and then of its being adopted at Paris, and Mr. Crumpton has thought a worthy of several. The difficulties of his operations, however, and tediousness of the after-treatment, and in particular the general course and formation of one of the two ligaments, as represented by himself, are sufficiently discouraging. No doubt, more limbs might be saved by this practice than by that of amputation, but many lives would be lost. On this principle I see no reason for preferring one mode to another. Many interesting observations on the extirpation of various diseased joints may be found in the above mentioned dissertation by Wacher, and in the analysis of it by Laingbeck.—(*Brit. Jour. de la Clin. & G. Gallien*, 1805.)

It is getting this part of the subject, I may just notice the interesting cases recorded by Mr. Bury of St. George's, which cut out several of the lateral bones, including the diseased surface of the acetabulum, and also some of the distal bones from a boy's knee, with complete final success. The dissection, however, was protracted, and great difficulty experienced in stopping it. Whether this last experiment merits admiration, I am not prepared to say; but, be this as it may, the fact merits attention.—(See *Med. Clin. Trans.*, vol. 11, p. 285.) Consult also White's Case in *Surgery*, published, *Mémoires politiques de l'Académie de la Clin. Paris*, 1779, p. 75; et *Mém. de l'Institut National*, vol. 5, 1795; *Revue de la Médecine*, &c. in *Revue des sciences*, &c. Paris, 1799. *Ph. Crumpton*, in *Dublin Hospital Reports*, vol. 4, 1827.

MODIFICATION OF THE STAPLER AND TOOL, AND PART OF THE CUT.

The best surgeons all agree with Mr. Sharp, that the amputation of the fingers and toes is most successfully performed in three articulations. With a common scalpel, the skin is to be cut through vertically, not exactly upon the joint, but a little towards the extremity of the finger, in order that a sufficient flap may

be preserved by covering the end of the bone. On taking away a finger from a natural bone, Mr. Hay recommends amputing the bone behind and with skin on each side of the joint, as a means of facilitating the separation.

In amputating the fingers and toes the operation is greatly facilitated by cutting thro' the joint instead of the bone. Having made an opening in the back part of the capsule, one of the lateral ligaments may easily be cut, after which nothing is to be done of the bone from being raised out, for the surgeon has only to cut through the rest of the exposed ligaments and ligamentous parts.

Some recommend holding a small bone-saw at an oblique to cover the bone; but this is quite unnecessary. If one be taken to hold the skin a little up, and to cut with Mr. Hay's finger-rover, the bone, as we saw in a small flap given little pain, I have generally preferred this method, though it appears at first nearly a matter of indifference which plan is adopted. In operating on the parts between the phalanges and metacarpal bones, a flap should always be made, either up the upper, or under part of the finger, or the thumb.

Although it is generally best to remove the fingers at the joints it is sometimes thought right, where the injury has perforated the joint and so near, to cut through the bone, instead of operating at the joint articulation.—See *Guidance in Gun-shot Wounds*, p. 264. The division can also be readily made with a cutting pliers.

It first happens, that the bones of the foot and fully part of the metatarsal bones are removed, in which case the leg need not be cut off, but only so nearly as the foot as is discoloured. A small opening now is here the most convenient. When this operation is performed, the hand and the remainder of the foot will be of great service, and the patient will be able to walk. Mr. B. Hay, in his book, has had to do with some such examples.—Op. of Surgery, chap. 20, sec. 2. Mr. Hay mentions this statement of Hay's concerning the impossibility of retaining the whole foot, when the metatarsal bones are cut, and every other part of the leg is saved, as the remainder of the foot is of importance in walking, the use of the ankle not being destroyed.

Mr. Hay describes a new mode of removing the metatarsal bones, which, on review, that has fully answered the expectations. By the first part I have seen a plan which method, which had not been previously described, though it may have been performed by others, since that by Mr. Hay himself, by the name of having first done it is required in the late Mr. Turner, of North Yarmouth, who did it with success about the year 1837.—(See *Philosophy's Pract. Dis.* p. 70.) Mr. Hay makes a mark across the upper part of the foot, to denote where the two first bones are joined to those of the tarsus. About half an inch from this mark, across the foot, he makes a transverse incision through the integuments and muscles, covering the metatarsal bones. From each extremity of this cut, he makes an incision along the inner and outer side of the foot, to the toes; he removes all the bone from the metatarsal bones, and then separates the metatarsals and ligaments, leaving the sole of the foot, from the lateral part of the metatarsal bones, leaving the edge of the bone as near the bones as possible, so as to be capable of supporting, and preserving as much regular flesh in the day as can be saved. He then separates the first sesamoid cartilages from their position with the tarsus, and divides, with a knife, the projecting part of the first sesamoid bone, which supports the great toe. The arteries being tied, Mr. Hay applies the flap, which had passed the sole of the foot, to the integuments which remain at the upper part, and keeps them united with sutures. The patient, having remained in the use of the foot, is in the state of being lame, while the other bones are removed; after, and is covered with some strong skin, and some previously dressed the sole of the foot, and a cast is applied by any suitable means.—See *Practical Observations on Surgery*, p. 222, &c.

When the metatarsal bone of the great toe is alone removed, Mr. Hay recommends amputating the skin the circular bone, instead of saving it. The latter plan seems to me to be unnecessary, unless the removal part of the integuments and muscles, and making a transverse as well as a superficial incision. These

disagreeable things may be avoided by following the method of Mr. Hay, or that of Mr. C. Hall. For removing the metatarsal bone, either of the little or great toe, the latter gentlemen direct us to carry a small incision round the end of the toe, and then along the sole of the foot. The finger is then to be dissected from the metatarsal bone, and to be separated from the skin, and an oblique incision to be drawn from the lateral part of the foot.—(See *Practical Surgery*, vol. 1, p. 202.)

The removal of the central metatarsal and metatarsal bones is not operation of great difficulty, and the saving of them is highly practicable, without requiring the use of pins. Hence, I considerably of them with Mr. C. Hall, in a case of a recent amputation, it is better to cut the metatarsal bones than the foot or hand, as, indeed, Mr. Hay says in the end of his book.

Thus, Mr. Hay, in his book, describes, in a new mode of taking away the middle finger with its sesamoid bone from the middle finger of the ring finger, with its metatarsal bone, from the middle finger of the lower, with the sesamoid and the metatarsal bone, in order to find out these articulations, he draws a line from the upper end of the metatarsal bone of the thumb straight across to the metatarsal bone of the finger to be cut, and then he cuts the bone between the two tarsus, which runs towards each side of the finger bone as directed by V. The bone is then separated of itself from the other parts, and discoloured from the carpus, when nothing remains to be done but to cut the bone towards the palm, where the wound is also made to resemble an inverted V, but does not extend any further than is necessary, to complete the operation.—See *Langebeck's Dis.* p. 1, p. 273 and plate 2, f. 1. This is a remarkably simple and excellent method of operating, which Langebeck has recommended as the best way of removing such bones of the metatarsals, as are so situated in the side of the foot; care being taken however a flap from the sole of the foot, difficult, however, to draw with certainty whether the dissection is perfect, as the metatarsal bone is not so distinct, and if it be not, and the circular incision be effected, the operation will not succeed, and amputation be necessary. This happens, it is said of Langebeck's case, in which he had removed one of the metatarsal bones.

Modern surgeons never separate the whole of the foot or hand, when there is a possibility of saving any useful portion of it, though the part may be more severely damaged. Thus, when a soldier has been struck by a musket-ball, which shattered the metatarsal bones of the little and ring fingers, crushed the middle finger, and tore up the sesamoid bone of the palm and back of the hand, Mr. Hay has succeeded in saving the two fingers and thumb, although, in the removal of the other parts, no regular flap could be made for covering the wound.—(See *Gun-shot Wounds*, p. 292.) In winter campaigns, the toes, and toes in case of the foot, are often situated with mutilation from cold. In these circumstances, when the dissection does not extend beyond the middle of the foot to the bone, it is only necessary to cut away the gangrenous part. On the first evening of the month May 1800, Mr. Hay, after the removal, removed not only many of these cases, in which it was necessary to take away the metatarsal bones, or sometimes those of the tarsus. All the patients separated from in two hours for the effects of cold were saved, making upwards of 1000 men, and not difficulty, according as the position of the tarsus was, and how great or small.—(See *Practical Surgery*, p. 202.)

Mr. Hay, in his book, describes, in a new mode of removing the metatarsal bone of the middle finger, with its sesamoid bone, and the middle finger of the ring finger, with its metatarsal bone, from the middle finger of the lower, with the sesamoid and the metatarsal bone, in order to find out these articulations, he draws a line from the upper end of the metatarsal bone of the thumb straight across to the metatarsal bone of the finger to be cut, and then he cuts the bone between the two tarsus, which runs towards each side of the finger bone as directed by V. The bone is then separated of itself from the other parts, and discoloured from the carpus, when nothing remains to be done but to cut the bone towards the palm, where the wound is also made to resemble an inverted V, but does not extend any further than is necessary, to complete the operation.—See *Langebeck's Dis.* p. 1, p. 273 and plate 2, f. 1. This is a remarkably simple and excellent method of operating, which Langebeck has recommended as the best way of removing such bones of the metatarsals, as are so situated in the side of the foot; care being taken however a flap from the sole of the foot, difficult, however, to draw with certainty whether the dissection is perfect, as the metatarsal bone is not so distinct, and if it be not, and the circular incision be effected, the operation will not succeed, and amputation be necessary. This happens, it is said of Langebeck's case, in which he had removed one of the metatarsal bones.

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Chakrabarti used to be every literary as most as it was decided. On the contrary, the constitution of the anterior lateral artery will require a signature, and in the male the internal and external plantar arteries, in the thickness of the flag of such parts, runs generally to taken up. One-half of each is destined to be put away, and the other one to be left hanging out between the shoulders, in the constant and more contracted pose.

Walter and Grant have given some very precise directions for the performance of this operation. A cut is first made, beginning half an inch before the water angle, and extending forwards along the side of the foot two inches. Another similar incision is then made from just in front of the toes back. The foot is now to be bent upwards, and the first incision sealed by a narrow adhesive, two finger-breadths from the side of the skin. A flap is then dissected up, as far back as the commencement of the lateral tarsometatarsal, or a fair correspondence to the anterior end of the ligaments with the os naviculare, and if the os cunei with the os cuboidei. An incision proceeds to the tendo-plantaris to separate the pulleys of his ligaments on the inside of each tarsal as described previously, and holds it the day. The extensibility of the skin is here to be fully displayed afterwards, so as to stretch the ligaments connecting the tarsal bones together. The ligaments between the metatarsals and the naviculars are to be first cut, when the foot may be thrown sideways outwards, and the ligaments between the os cubiti and os cuboidei divided. The division is partly completed by drawing through the soft parts regularly from above downwards, with the pressure of drawing the tending force held on as far back as they are used as part of the sole of the foot. See *Atlas*, and also *Guise's* *Art. Pratic. Med.*, ed. Lavoisier, 1804, t. 1, p. 152; and *Grant's*, *Norwich* 1810, p. 170. *Guise's*, p. 180.

[illegible]

cf. stickleplaster, perfectly [adjective]—70p. iii. n
23—24.)

The first acquisition of the Gower was made in 1845, by John Wood. The acquisition is evidence of the Gower given as a first performed in this country by Mr. David L. Hays, of the University of Michigan, in 1845. The first of the series of the first, reference may be made to the N. Y. Med. and Surg. Journal for 1845, vol. 1, p. 201. For illustration of the series of the series, see the illustration, performed by the first time by Mr. Wood in 1845, and also by Mr. Wood in 1845.

The following contains a list of the principal authors of the *Asymptote*, as published in the *Journal de l'Asymptote*, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475,

first attended with a division of all the coats of the vessel. The loss of the disease is only seen at the head of the aneurism, where the artery is exposed to injury in venousness.—See Bismuth, &c. In some circumstances, as when the pulsation is made, the blood gushes out with unusual force, and in a bright vessel, strongly interrupted current; flowing out, however, in an even and free rapid stream when pressure is applied higher up than the vessel. These facts are the most decisive marks of the artery being equally dilated everywhere from above with great rapidity, and in a broken stream, when the vessel is torn and dilated immediately over the aneurism, which regards its position in it. The stagnation collections precipitate it stop the aneurism by pressure, and in general a diffused false growth is the result. The external wound in the skin is closed so that the blood cannot escape, but this does not hinder it from passing into the cellular substance. The swelling thus produced is sterner when healthy, and extends upwards and downwards along the trunk of the vessel. The aneurism is usually of a dark purple color. Its size increases as long as the arterial aneurism continues, and if the blood passed beyond certain bounds, mortification of the limb ensues. Such is the diffused false aneurism from a wound.

The circumscribed false aneurism, from a wound or puncture, arises in the following manner. When foreign pressure has been made in the first instance, so as to separate the laminae, but the laminae had afterwards been reunited, so that, as before the artery has healed, the blood passes through the interstices, so that which has burst open again, forms the cellular substance. As this time more applied pressure by the preceding pressure, the blood carried off itself and its cells, and consequently a mass of it collects in the vicinity of the rupture of the artery, and forms the cellular substance into the form of a sac. Sometimes, though not often, the circumscribed false aneurism originates immediately after the opening is made in the artery. This chiefly happens when the rupture in the vessel is extremely small and consequently when the surrounding parts close so slowly that the blood, which is first effused, coagulates, and prevents the entrance of that which flows into the cavity of the cellular substance, and of course an aneurism. False aneurisms, proceeding from the rupture of the larger coats of an artery, are always in first circumstances by the dilatation of the outer coats.

The circumscribed false aneurism originates in a rupture of the external coat of the artery, as it was first given way to is composed of an artificial pouch formed among whatever parts happen to be in the vicinity of the ruptured artery. This cavity is filled with blood, and external close to the artery, with which it has a communication. Hence is false aneurism a throbbing is always perceptible, and is more manifest the smaller such tumors are. The larger one becomes the less elastic it is, and the greater the quantity of laminated coagula in it; so that it very large the pulsation of this kind the pulsation is somewhat wholly lost.

The aneurism is first small, and on compressing entirely disappears; but returns as soon as this is removed. It now increases when the artery above it is compressed; but remains the vessel remains immediately with pressure is diminished. When there is interrupted blood in the artery, pressure is no longer capable of producing a great disappearance of the tumor, which is now hard. The swelling is not painful, and the aneurism is not changed in color. It constantly increases in size, and of length until a prodigious magnitude.

The following are generally observed in the distinguishing differences between circumscribed true and false aneurisms. The true aneurism readily yields to pressure, and its ready return on its removal; the false one yields very gradually, and returns in the same way; and as it contains laminated coagula, it is not so much as the same degree by compression as an aneurism formed by a rupture of the arterial coats, where each strand of coagulated blood is tightly packed. Frequently a swelling local to itself when the blood passes over it. The pulsation of the false aneurism is always soft and feeble, and as the tumor enlarges it is more lost than that of the true one, which striking after a long aneurism a considerable volume.—See Richter's *Anatome*, &c.

PROGNOSIS OF ANEURISM.

If the definition of aneurism, published in 1804, had proved correct, the grand definition of aneurism into true and false would have been rejected as erroneous: "for," says he, "after a very considerable number of investigations, instituted on the bodies of those who have died of internal or external aneurisms, I have ascertained, in the most certain and unequivocal manner, that there is only one kind or form of this disease, viz. that caused by a rupture of continuity or rupture of the proper coats of the artery, with effusion of blood into the surrounding cellular substance; which collection of continuity is contained, sometimes by a vessel, sometimes, chiefly degenerated, a growing vessel, or a rupture of the proper coats of the artery, I found the internal and external, within the circumference of a preformational dilatation of these coats being essential to the formation of this disease; and have seen two very aneurisms, whether it be stopped or external, uncorrected or difficult, is always stopped by aneurism."—On Aneurism, treated by Wilson, 1791.

According to Scarpa, it is an error to suppose that the aneurism at the circumference in the neck of the aneurism, produced by a rupture and rupture of the artery, is at the heart is aneurism, and proceed by a preformational dilatation of a certain portion of the artery, or a rupture of continuity of its coats, which always to be considered a rupture formed by the rupture and dilatation of the artery, and of the artery itself, that is, of its internal, and fibrous coats. Scarpa considers it inadmissible that such aneurisms are produced by a rupture and rupture of these coats, and consequently, by the effusion of arterial blood, under the cellular sheath, or other membrane covering the vessel. If ever there is a certain degree of preformational dilatation, it is an exception to the rule, for it is not a constant occurrence; other aneurisms are attributed to it, and in those rare cases in which an aneurism is produced and occurs, and by a certain degree of dilatation of the whole chamber of the aneurism of the artery, there is an evident difference between an aneurism which is dilated, and a pouch which forms an aneurism.

Caroli describes, says Scarpa, will prove that the aneurism contains nothing in the formation of the aneurism, but that this is merely the cellular membrane which, in the second case, encloses the artery, or that the cellular sheath which the artery received in common with the neighbouring parts. This is raised by the blood (the form of a tumor), and is covered in common with the artery by a smooth membrane.

The same professor does not deny that from congenital dilatation the proper coats of the artery may, occasionally yield and become disposed to rupture; but he will not admit that dilatation of this artery produces and accompanies all the aneurisms, or that its proper coats ever yield so as to dilate as to form the aneurism. The fact of an aneurism of the artery never includes the whole circumference of the artery; but the aneurism separates from and extends the form of an appendix or tubercle. On the contrary, the dilatation of the artery always extends to its whole circumference, and therefore differs essentially from aneurism. Thus, he argues that there is a remarkable difference between a dilated and aneurism. Although these two affections are sometimes found combined together, especially at the neck of the aneurism. If we also consider that the dilatation of an artery may exist without any organic affection, the blood being always in the cavity of the vessel; that in an artery affected there is never collected any granular blood or polypous mass, that the dilatation never forms a tumor of considerable bulk; and that while the continuity of the proper coats remains intact, the circulation of the blood is not at all, or not so severely changed; we shall be obliged to allow, that aneurism differs essentially from dilatation of the artery.

Some additional remarks on this topic have recently published by Scarpa will be presently considered.

By dilatation of arteries both in the sound and morbid state, Scarpa endeavors to demonstrate what share the proper and external coats of the artery have in the formation of the aneurism, and what belongs

is the cellular covering, and other adhesions must be removed surrounding the injury.

The opening of an artery is usually an aneurismal abscess which the vessel continues to contract with the parts in the vicinity of which it rises. The entire aneurismal sac is the natural extension of the vessel, and the vessel itself and generally ends in the abscess.

The portion extending is undoubtedly round the cellular and trunk of the aorta, the aorta, secondary, and small arteries; it is less dense round the trunk of the arterial, venous, and pulmonary arteries. The arteries are over the cellular sheath of the arch of the aorta, and says that of the thoracic aorta; while that of the abdominal aorta is covered by the peritoneum. Both these vessels sometimes adhere to and increase the mobility of the circumference of the vessel. The great arteries of the extremities are not covered by adhesions to the cellular substance by any special membrane of any sort, but by a cellular sheath, which is demonstrably distinct from the adipose membrane, and serves to enclose the vessels, and connect them with the contiguous parts.

When an artery is injured by a sharp body, mainly antero-posteriorly between the cellular covering and the subjacent muscular coat of the artery, the injured vessel escapes into the tissue of the cellular membrane, which closely embraces the artery, without partially destroying its cells, which is dependent on a remarkable quality. When incised was a vessel and packed with much force, the cellular sheath of the artery is not only raised over the vessel like a lamp, but the internal point in that position is also damaged, and on examining afterward the capsule of the artificial aneurism, it appears as if it were divided of several layers, rough and irregular internally, smooth and polished externally. The same thing happens when any incision is packed with such force into an artery as to rupture the internal and muscular coats at some point of their circumference. Numerous experiments have confirmed several things before the Royal Society.—Philos. Trans. in 1728. As soon as the internal coat is ruptured, the aneurismal sac gives way; but the external cellular sheath being of an adhesion nature, and the thin lamina of which it is composed being not adapted to the motion, but reciprocally interlaced, is capable of supporting great dissection by yielding gradually to the pressure of the blood, without being torn or ruptured.

Scarpa is further of opinion that the same phenomena may be observed when the internal coat of the laminae of the vessel is to be ruptured by the repeated jets of blood from the heart. In this circumstance, the blood, expelled by the heart, begins immediately to seep through the circumference of the fibres of the muscular coat, and gradually to be effused into the interstices of the cellular covering, forming in a certain extent a kind of aneurismal or extravasation of blood, slightly elevated upon the artery. Afterward, the points of contact between the edges of the fibres of the muscular coat being unusually separated, the arterial blood, passing between them, fills and elevates in a remarkable manner the cellular covering of the artery, and raises it after the manner of an incipient aneurism. Thus the fibres and layers of the cellular coat being raised or loosened, or simply separated from each other, the arterial blood is forced with great force and in greater quantity than before, into the cellular sheath of the artery, which it flows more gradually; and finally, the division between the laminae of the cellular sheath being ruptured, it is converted into one, which is filled with polyposal concretions and red blood, but at last, finally, slowly spreading, the aneurismal sac. The internal texture, although apparently composed of numerous planes one over the other, is in fact, very different from that of the proper coat of the artery, notwithstanding the arterial vessel and aneurismal sac are both covered externally by the cellular sheath with a smooth membrane.

Scarpa has examined a considerable number of aneurisms of the arch and of the thoracic and abdominal trunk of the aorta, without finding a single one in which the rupture of the proper coats of the artery was not evident, and of which, consequently, the sac was produced by a cellular coat, completely different from the arterial and muscular coats.

The aneurismal sac never comprehends the whole circumference of the vessel. At the place where the

artery joins the sides of the vessel, the aneurismal sac proceeds a kind of constriction, beyond which it becomes broad or less expanded. This would never happen, or rather the constriction might be more evident, if the sac were formed by an elastic membrane as the tube and proper coats of the arterial artery. In such cases, aneurismal, at least, the pressure and of the artery would give to the artery itself, at risk of the swelling, pulsations which would be the best. The thinner aneurismal in extent, and small, or of long standing and large, the pressure from the artery is always narrow, and the diameter of the aneurismal sheath is proportioned to its distance from the vessel. The sac is always covered by a cellular sheath with delicate cellular substance which extends the artery in a certain extent to the circumference of the vessel. Each cellular substance is a continuation of the proper coats of the artery, and in those of the abdominal aorta by the peritoneum, which sometimes include the sac and ruptured artery, presenting externally a continued known surface, just as if the artery itself were divided. But if the sac is opened lengthwise on the side opposite the constriction at each of the extremities, the place of the constriction captures all the proper coats of the artery immediately appears within the vessel, on the side opposite to that of the incision. The edge of the fold which has taken place is sometimes fringed, often callosal and hard, and through it the blood flows out from a pulsating artery, the cellular sheath which is converted into the aneurismal sac. If so sometimes happens in the trunk of the aorta near the heart, the artery, before being ruptured, has been somewhat dilated, it seems as if it was a thin wall (two coats) but the constriction which the aneurismal to the artery presents externally, points out exactly the place beyond which the internal and muscular coats of the aorta had not been able to resist the distension, and where of course they had been ruptured. The portion which only always is seen dividing the folds of the artery from the aneurismal sac, and which is located in the middle, consists of closing one that the remains of the arterial and muscular coats of the ruptured artery.

By carefully dissecting the proper coats of the ruptured artery in its situation, and comparing them with the cellular substance forming the sac, Scarpa affirms that the truth of the preceding statement may be indisputably demonstrated.

When we incise a made lengthwise on the side of the vessel opposite the rupture, its proper coats are found either perfectly sound, or a little ruptured and stained with earthy points, but still capable of being separated into distinct layers. On the contrary, in the opposite side of the aorta, where the rupture is, the proper coats are usually thin, and not only separate from each other with difficulty, or even not at all; they are frequently brittle like an egg-shell, and are disorganized and torn at the place where they form the partition between the ruptured artery and the pouch of the aneurismal sac. Contrasting to separate these coats from within outward, we observe at the cellular sheath surrounding the artery. This sheath being much thickened by large polyposal, and very adherent to the subjacent aneurismal coat of the artery at the place of the constriction of the sac, is very apt to be mistaken for a dilated portion of the vessel itself. But even in such cases we find it is not separate, it without laceration, from the tube of the artery above and below the injury, and continuously from the aneurismal sac as far as the neck of the aneurism. Then it is clear the aneurismal coat does not pass beyond the partition separating the cavity of the artery from that of the aneurismal sac, over which it is not prolonged, but terminates at the edge of the rupture like a flap, or in oblique points. Layers are such apt to be torn is consequence of the sac and sac being both covered by the pleura or peritoneum.

The portion of the sac within the pericardium being only covered by a thin red elastic layer of the membrane, such layer may also be lacerated when the proper coats give way, and blood be effused into the cavity of the pericardium. Examples of this kind are related by Walker, Morgagni, and Scarpa himself. In the latter instance, on making an incision into the convex part of the sac, opposite the incision which had lodged under the layer of the pericardium, which had been burst by a vessel ruptured, an arterial coat, corresponding to the face of the vessel, it is quite rough, interrupted

with yellow blood spots, and is easily altered for the worse of an inch in circumference. The population is preserved in the caputular part.

But all over parts of the aorta flaring, between them and the plexus and peritoneum, a cellular sheath of a structure and more yielding nature, which almost seems to be distended with air, and being strengthened internally by polyplous layers, and externally by the plexus of peritoneum, appears for a long while the last effluvia of blood.

Scarpa believed that what he calls the *sheath*, *membrana*, *flaccida*, *extrema*, *degenerata*, of the internal coat of the artery is more frequently the cause of its bursting than either extension of the whole body, laceration, or an external pressure of the heart. This kind of changed change is very common in the coronary, and in the thoracic and abdominal trunks of the aorta. In the highest kind of such disease the internal coat of the artery loses, for a certain space, its beautiful structure, and becomes irregular and wrinkled. It afterward appears interspersed with yellow spots, which are converted into streaks or perforations, or into dilatations and cleaves into aneurisms, which require the external coat of the artery to be, and is slightly lined in the adjoining muscular wall, that upon being nearly separated with the knife or pincers of the aneurism, are readily detached from it, and on being cut it gives a weakling sound, similar to the breaking of an egg shell. This condition cannot be said to be proper to old age, since it is sometimes met with in subjects not much advanced in life. The whole of the side of the aneurism, at that portion which is contained by the naked effluvia, is, for the most part, hard and rigid, sometimes soft and fungous, and in most cases the coat of the artery is permanently extended, to the highest degree of its natural dilatation, that dilatation is based on the inside of the artery. Right heart and lunged organs, lungs, and vessels, — in the internal and thoracic coats of the artery.

Having presented the reader with an abstract of the most important remarks made by Scarpa in support of the doctrine he defends, I now state his conclusions. 1. That thick dissections apparently formed by the rupture of the proper coats of the artery. 2. That the aneurismal sac is never formed by a dilatation of the proper coats of the artery, but is produced by the cellular sheath which the artery carries in common with the plexus contiguous to it; after which cellular sheath the plexus is placed in the thorax, and the peritoneum in the abdomen. 3. That if the aorta, immediately above the heart, appears sometimes increased beyond its natural diameter, this is not common to all the rest of the artery, and when the aorta in the vicinity of the heart tends to a dilatation greater than natural, this dilatation does not continue, properly speaking, the extent of extension. 4. That there are none of these marks regarded by medical men as characteristic of aneurism from dilatation, which may not be met with in aneurism from rupture, including even the characteristic figure of the aneurism. 5. That the dilatation of aneurism, whether in the coronary, abdominal, or thoracic, is only the production of a false layer; whose dilatation shows that there is only one form of the disease, or that caused by a rupture of the proper coats of the artery, and an effusion of the internal blood into the cellular sheath which surrounds the ruptured artery. — See *Treatise on Aneurism*, by A. Scarpa, trans. by J. H. Wainart, Edit. 1806.

Scarpa was the author of a work by Scarpa, in 1801, one of the most distinguished anatomists and surgeons of the present day upon the subject. It has been already stated, that, great as this authority is, several eminent modern surgeons, as Rokitansky, Boyer, Dubois, Dupuytren, Schlegel, Brodie, &c., did not find it, but still repeated that at some aneurisms the coats of the artery were dilated. These professions of Pott were contradicted only what has been usually taught upon this subject, the surgical wisdom of Great Britain. Every surgeon here has been accustomed to describe the dilatation of aneurism, whether in the coronary, or any other cases which are accompanied with dilatation, and into others which are attended with rupture of the arterial coats. A few years ago Mr. Hodgson, of Birmingham, published a valuable treatise on aneurism, in which work he follows Boyer, Scarpa, and joins these surgical writers who believe in the occasional dilatation of the coats of the arteries in this case.

Mr. Hodgson, "In every aneurism produced by a dilatation of the arterial and middle coats of the vessel, and there is not a partial dilatation of these coats, consequently possible not given them all their former elasticity. I believe that this is frequently the case." Mr. Hodgson says that the dilatation of the coats of an artery, by destroying their natural elasticity, will give rise to permanent dilatation of the whole artery, even at the root; and there is every reason to expect that a loss of its elasticity in a portion only of the diameter of the vessel, will give rise to a partial dilatation of its circumference, therefore of a partial dilatation of the coats of an artery, particularly of the artery, are consequently established by the possibility of sharing the coats of the vessel throughout the whole extent of the dilatation, and by the existence of these partial aneurisms in the artery which are peculiar to the coats of the artery.

In the year 1801 (says Mr. Hodgson), I observed an aneurism of the aorta, which was removed from the body of a young woman by an friend Dr. Keane. The sac was as large as a small nut, and had passed into the thorax, and the posterior mediastinum, and subsequently into the cavity of the chest. This aneurism exhibited the formation of aneurism by partial dilatation in three distinct stages. The internal coat was thinned, dilated, and converted a fully and irregular appearance. At the apex of the aorta there was a dilatation one larger than the half of a small nut. About two inches lower in the same vessel was a second dilatation, which would have contained a hard nut, and immediately above the third dilatation was the large aneurism which had proved fatal. I observed that portion of the vessel which contained the smallest dilatation, and assumed it with the coats could be separated without violence. I found that the dilatation extended equally the three coats of the vessel, and, when separated, each presented the appearance of a membranous sac. The second dilatation exhibited the same characteristics as a more advanced stage. The coats of the vessels were more intensely altered in each other than in a natural state, but it was evident that the dilatation extended in a dilatation of the internal, middle, and the external coats of the artery. In the large aneurism the dilatation of the internal and middle coats could be traced at some distance into the sac, when the aorta continued in the position mentioned and the vessels formed the remainder of the cyst. There can be no doubt that the one aneurism in a dilatation of the coats of the vessel, similar to the appearance which existed in the superior portion of the aneurism, and the artery appeared to illustrate the formation of aneurism by partial dilatation in three distinct stages. — Hodgson on the Diseases of Arteries, and Veins, p. 165, 166. As far as Keane's information extends, possibly better, Mr. Hodgson had examined the dissection of an aneurism, in this aneurism, and, by transference, and the results, he thinks, are not unlike to the present aneurism. — See the former report of Mr. Hodgson's work, with notes by Keane and Robinson, in 1811, London, 1811.

Mr. Hodgson has seen this partial dilatation in aneurism of the arteries, which are subject to aneurism: in the division of the aorta and iliacs; in the aneurism of the brain, &c.; and he agrees with Dr. Baillie, Marshall Hall, &c., in saying that the dilatation of the artery, in the aneurism, is the origin of the aneurism, and generally caused by dilatation of the coats of the vessel.

Partial as well as general dilatation says Mr. Hodgson frequently provides the formation of aneurism in the aneurism of the aneurism. A gentleman had a large aneurism in the thigh which had undergone a spontaneous cure. Upon examining the limb after death, the position of the artery was found to be thickened and covered with calcareous matter. A small pouch, which would have contained the seat of an aneurism, was formed from the side of this artery. This little sac was evidently formed by a dilatation of the coats of the vessel. A vein had been the situation of an aneurism in the heart; in the inferior artery there was a small aneurism about as large as a walnut. The external coat was dilated from the rupture of the internal coat to a considerable extent. The internal and middle coats were evidently dilated, and contained in the formation of the sac. The dilatation of these coats was gradual, and they continued for a considerable time.

seeking Valsalva's treatment of aortic aneurism. These and applications have been employed for the purpose of promoting the absorption of the blood. When the aneurism was not the consequent obliteration of the cavity of the aneurism and the artery. Various examples in which it has been known to have produced a cure are recorded by Goussier.—*Bulletin Periodique de la Société de Médecine de Paris*, No. 2, Bulletin, Clinique, Chir., and Bilio, *Bulletin de la Faculté de Médecine de Paris*, 1847, No. 1 and 2, p. 246. The employment of this method, is not considered proper in every case.—*Bringing says*, that when the aneurism is large, the cure very times, that rupture charged, and the vessel then, the patient is likely to sustain the rupture of a stomach; and he mentions a female made by Mr. Hildesheim, that some patients cannot tolerate this treatment longer than a few minutes, while others find it absolutely insupportable.—*Ed. Transl. of Mr. Hildesheim's Work*, p. 2, p. 222 & 223.

The great vessels may be depended upon for carrying nutriment to the organs of the body. This vessel certainly receives the great ingrain of blood into the arm, and, with a valve as significant, more exactly within the artery, communicates with the rest part of the vessel, and by the help of the opposite valve it gradually ascends, brings about their action, and an obstruction of the rate of the vessel, with gradual degeneration. The great carrying of blood into the arm of the vessel, the contents of the arteries are upward gradually absorbed, and the remainder in the artery is prepared. The natural course of the blood being kept permanent, interrupted to the arterial trunk, it passes more rapidly into the arterial branches, and thus gradually and accumulated with more and more from the large arteries beyond the obstruction, the necessary circulation is carried on.—*See Anæsthesia and the circulation.*

The treatment of the superficial femoral artery may be performed with the same confidence of success as obliteration of the radial artery; that is, without any fear of destroying the circulation or stopping the principal uses of the artery. Indeed, the treatment and consequences of aneurism which are met with all over the body, correspond exactly with those which are observed around the elbow, and at the head of the arm. This is not a peculiarity of the arteries of the extremities, but it is a general rule, which nature has allowed in the construction of all the vessels that the vessels trunk communicate with the artery by means of the lateral vessels. After the principal trunk of an artery, as well as lateral branches not only carry in the circulation of the parts below the ligature, but also with greater quickness and activity than they did previously, while the course of the blood was unimpeded through the principal trunk. This evidently arises from the increased denudation of blood into the lateral vessels, as well as from the enlargement of the diameter of these vessels. After the separation of the trunk, while the blood flows in a fast stream from the superficial femoral artery, very little arterial blood is poured out of the lateral vessels; but as soon as the artery is cut, the blood immediately impetuously flows through the lateral vessels, and on these lateral arteries being divided, the blood immediately issues out from the minute arterial vessels of the patient's skin, and other vessels. When the principal trunk of an artery is cut, its lateral branches gradually become a much larger artery. After separation of the trunk on account of a ligature, however, the size and situation of which could not be manually to expose the course of the blood through the trunk of the femoral artery, a few years have manifested, that, although both the trunk and the great and smaller branches had been cut with the same accuracy, the patient has been in danger of being thus lost in a short time the repeated attacks of aneurism from the immediate small lateral vessels that had become extremely enlarged. In several cases, during the treatment, and especially when the radial artery, of patients aneurism by tying the superficial femoral artery of the arm, and at the thigh, all the paravascular of the nearest arterial arteries have been felt swelling strongly from the above. We have already noticed that there was in a man who some years previously had been operated for a popliteal aneurism, but had abandoned, and when a cure of the aneurism, as an animal killed many, that the

volume of the radial nerve was divided so much as to be equal in diameter to the radial artery. When, in observing the arm of a lady who, fifteen years before, had been operated for an aneurism in the head of the arm, I found the radial artery obliterated and converted into a solid cylinder for three inches below the place of the ligature, and the rest of the artery was the radial and nerve branches, and the recurrent radial and other ligaments had become so much enlarged that taken together, they extended the size of the radial artery above the separation of the ligature. In this last body, it is found that an aneurismal hypertension will pass more slowly than the ordinary in the arteries, and much more slowly than in a catheter, and that when the vessels are very enlarged, although it is well known that the circulation through the enlarged vessels is not inferior to the ordinary, and that the latter does not differ in its principal parts; yet aneurismal hypertension, this difference is not to be considered very high, but in cases of popliteal aneurism, or other arteries, the aneurism is the artery, whether the lateral artery be cut very low, deep or very high up in the thigh—*See page.*

The history of the progress of the blood through the lateral vessels is not the same in patients of aneurism as in the case of the trunk of the artery in the trunk of the artery. An aneurism being formed, the operation being done on the artery, which is under the course of the circulation than the other extremity, aneurism is the cause of aneurism. However, notwithstanding these are the opinions of Scarpa, and as several cases may not be correct, I should like to find some cases for aneurism of the large extremity, and as patients with aneurism, they are very few, with aneurism of aneurism which nothing but great common aneurism.

According to Scarpa, the permanent, chiefly aneurismal aneurism, commonly in the popliteal and femoral aneurism, are the following: rigidity, aneurism, or aneurismal aneurism of the popliteal aneurism, between the superior and inferior aneurism of the arm and leg; sometimes depending on an advanced age, or on it together with the large part of the aneurism, which by long continued pressure has caused a great change in the neighbouring parts; or sometimes on aneurismal aneurism, early, aneurismal aneurism, aneurism of the inferior ends of the artery, not confined to the part of the rigidity, but extending a great way above and below the aneurism, and also in the popliteal popliteal aneurism, rigid aneurism, and, occasionally, to portions of the whole trunk of the superficial femoral artery. Sometimes the pressure of a large aneurism renders the thigh-bone carious. In aneurismal aneurism, the ligature is applied in closing the trunk of the artery; and, if it is applied above the site of the aneurism, it is well seen that a sufficient quantity of blood being conveyed into the lower part of the limb. Hence, when the patient is made aneurism in the thigh and leg; when the trunk of the artery is rigid, and incapable of being acted by a ligature; when the aneurism, and long aneurism and aneurismal aneurism, with rigidity of the aneurismal aneurism; when the leg is weak and cold, much aneurism, heavy, and aneurismal aneurism, Scarpa considers the aneurism aneurismal aneurism. I must, however, declare in this place that I have seen very large aneurism, as well as aneurismal aneurism of aneurism, and, even by the ligature of the trunk of the aneurismal aneurism, and with respect to the aneurism of the trunk, though it may be an aneurismal aneurism, its consequences are not so serious as some of the other aneurism, as I have already mentioned.

It appears, then, that the aneurism of the artery for aneurism, and above and below the place of rupture, forms the primary aneurism in the radial artery of aneurism, whether compression in the artery is employed; and other means are only auxiliary. Internal aneurism may be useful, inasmuch as they tend to moderate the denudation of the blood through the trunk when the artery has been cut or aneurism.

In the *Articles Anæsthesia and Ligature*, I have related in detail the effects of the ligature upon a dead artery, and particularly the various processes which arise from its application, and especially to the permanent obliteration of the vessel. In the same place I have explained what are the best ligatures for use, as well as the other question of tying them. Continuing myself,

in the sequel of this article, to what expressly refers to aneurism, I shall here merely name, the following general directions, as stated by Mr. Hodgson.

First, The cord should be drawn and raised, until a ligature being applied to it effect a violent division of the internal and middle coats of the vessel, and the latter to produce extensive ulceration or sloughing.

Secondly, The ligature should be tight, in order to ensure the extensive division of the internal and middle coats, and to prevent its detachment; it being almost impossible, even with the elastic ligature, suitably put through a healthy artery.

Thirdly, The vessel should be detached from its connection only to such an extent as is necessary for the purpose of its ligature and removal.

Fourthly, The complete division of the vessel, should be preceded by all such means as the known or probable process of granulation.—On the Diseases of Arteries, p. 325, 326.

In the course of his experiments upon ligatures, to determine the operation of the ligature, Dr. Jones arrived at a fact which effected the probability of leading to an improvement in the operation for aneurism.—(Treatise on Aneurism, chap. 2.) When a small, thin ligature is applied to an artery, it causes a division of the internal and middle coats; and if it be afterwards removed, an effusion of lymph takes place between the cut coats, and the result is the cure.—If several divisions of the internal and middle coats be thus effected in the vicinity of each other, the effusion of lymph was found by Dr. Jones to be sufficiently extensive to obliterate the cavity of the vessel. In the year 1820, Mr. C. Horsfield and the brilliant services of two Aps., and removed the ligatures immediately after their application: in both instances, as he observes in the complete obliteration of the canal of the artery was the consequence of the operation.—See *Practical Observations on Surgery*, p. 162.

It is immediately after the operation for aneurism, the ligature should be removed, and yet the vessel become obliterated; it would be highly advantageous, as there would then be left in the vessel an extensive substance to prevent its return, or promote secondary hæmorrhage by obliterating the slightest of traumatic process too far. It is to be expected that success has not attended the operation of the experiment by others. Mr. Hodgson tried it, but the artery did not become obliterated.—See *Experiments A and B*, p. 225, 226, of this gentleman's work.

Mr. Horsfield of Norwich made the experiment not less than seven times in horses and three times in sheep, and failed in every instance in which the same results as Dr. Jones. Not only was no granulation formed, but even when the effusion had been suffered to dry until the twentieth, thirtieth, and eightieth days after the operation, the canal of the artery was not found obliterated. In such case, indeed, it rather was contracted; but it was still capable of transmitting a limited column of blood.—(Horsfield in *Med. Clin. Trans.*, vol. 1, p. 422.) Thus it appears, that an effusion of lymph is an inevitable consequence of the operation, and as Mr. Horsfield has observed, the want of union is therefore owing to the opposite sides of the vessel, not being retained in a state of contact, on an effort of their tension.

The presence of the ligature in the canal, would be the explanation upon which it could be the success of Dr. Jones's experiment if approved, only inasmuch that the opposite sides of the wounded vessel would be retained in contact, until their edges were sufficiently invaginated to meet the passage of the fluid through the tube. The object might readily be supposed by dissection, that the invaginations occurring, with a degree of pressure as would exist throughout sides of the artery in contact at the bottom of a wound would give the great advantage required.

It is referred to Mr. Travers that a ligature was applied to an artery, and suffered to remain only a few days; the effusion of the organized system would be sufficiently augmented to ensure the obliteration of the vessel; and by the removal of the ligature at this period, the invaginations attending its removal would be obtained. The danger produced by the removal of a ligature upon an artery does not flow from the effusion, which a foreign body produces in its course. Ulceration has never been observed to ensue, even in less than twenty-four hours after the application of a ligature; and it is an unquestioned fact, that lymph is a favorable mode for obliteration to

have than six hours, in a wound the sides of which are preserved in contact.—(Jones, *op. cit.* vol. 1, p. 424.) We suppose, therefore, to ensure their union, that the wounded ends of an artery be kept in contact by a ligature only three or four hours, after which it might be removed to a great degree by ensuring the invaginations of the vessel. Justified by this reasoning, Mr. Travers performed several experiments, by which he ascertained that if a ligature was kept six, two, seven, or ten hours, the vessel was sufficiently preserved to effect the permanent obliteration of the canal. It appeared probable that the vessel would be obliterated upon the fourth, sixth, or a longer, subject.—See *Transactions of the Med. Clin. Trans.*, vol. 4, and *Hodgson on the Diseases of Arteries and Veins*, p. 325, et seq.

Mr. A. Cooper performed one operation in a patient according to the view of ligaturing, the efficacy of such a method as the following subject. He completely stopped the flow of blood for thirty-two hours, and then removed the ligature; the obliteration of the vessel was complete. He then applied the ligature every twelve hours, and the end of which two or three hours occurred on the eighth, ninth, and tenth day, after which a considerable hæmorrhage took place, and it was necessary to take up the vessel again.

Mr. C. Horsfield tried this method, as recorded by Mr. Travers, in an aneurism which he performed in a patient according to a scheme, in Nov. 1818. A double ligature was passed under the brachial artery. The ligatures were first with loops or slip-knots, which a quarter of an inch of the vessel being left undisturbed between them. All that was retained of the portion of the brachial was a slight transitory motion. Sixty-six hours having elapsed from the application of the ligatures, the vessel was carefully opened, and the ligatures raised and removed without the slightest interference of the vessel. As soon then as a patient appeared the artery became distended with blood, and the pulsation in the femur was as strong as they had been before the operation. Mr. Horsfield then applied two fresh ligatures; hæmorrhage afterwards took place, amputation was performed, and the patient died.—(See *Practical Observations on Surgery*, p. 161, &c.)

Now, as Mr. Horsfield chose, to apply other ligatures on finding that the pulsation returned, the above case only proves that the artery is not obliterated in about six hours, and we are left in the dark respecting the great gloom, namely, whether the vessel would have become obliterated by the effusion of coagulating lymph and the adhesion of the vessel, and the obliteration of the system of circulation through it.

As for the hæmorrhage which occurred, I think a slight hæmorrhage existed, considering the distance and situation which the artery was once contained in the vessel, and the necessity for the application of a pressure less than four ligatures, and the removal of two of them. According to my view only one ligature ought to have been used, and none of the artery detached.

We also have an illustration of the use of ligatures which were employed; an essential piece of information furnishing a judgment of the merits of the preceding method. The application, removal, and replacement of ligatures are not constant, will not be permitted to be continued by the patient, and will not be more tedious than that recorded by Mr. Horsfield, brought on the operation of the artery, and hæmorrhage.

The basis of this work, presents us here, pointing out the particulars of the very interesting experiment conducted by Mr. Travers, upon the arteries of an animal, for the purpose of ascertaining the earliest period when a ligature might be removed, even, an artery, without any violent hæmorrhage being fully anticipated. A full detail of them may be sought for further reading, in *Med. Clin. Trans.*, vol. 4, and in a very recent, in relation to the same operation, may likewise be perused in *Scott's comments on his great work on Aneurism*.—(Scott's work on Aneurism, vol. 1, p. 112.) The cases above stated, and other observations, have been explained by Mr. Horsfield in the explanation of Mr. Jones, upon the plan of securing the ligature previously to the internal separation, which he has written in the explanation of the case of aneurism, being either an obliteration of

In favour of extirpation as a ligature, where the ends of it are to be cut off, a case published by Mr. A. Cooper deserves particular notice. The wound was found completely closed on the fourth day after the operation, notwithstanding the patient was eighty years of age. The night previously to its application was softened in warm water. The recovery was complete; a fact strongly proving the propriety of not rejecting an operation on account of age, if no other objections exist.—(See *Surgical Essays*, part I, p. 136.)

From what has been stated in the *Lancet*, however, it seems that Mr. Astley has recommended both the use of catgut ligatures, and the plan of cutting off both ends of such ligature. With regard also to silk ligatures in particular, if we take into the account the little attendance, suppuration, and hard knots, which occurred even after their use in this manner, I don't think though these complaints might be attended with no severe consequences, they will deter many surgeons from adopting the (new) mode; unless it can be proved that these disadvantages, slight as they may be, are counterbalanced by the greater healing of the incision, or some other decided benefit. As it would interfere with the most possible risk of being followed by secondary hæmorrhage, however, I consider it inferior to no practice which has yet been suggested; not on I know of any serious objection to it, at any point of view, provided exactly such ligatures are used as Mr. Lawrence recommends.

It seems it is asserted, a single small ligature, compared to Hunter's silk, silk, or catgut, is now usually preferred by the majority of the best surgeons in England; but as the right qualities of ligatures are themselves considered—on *Hæmorrhage and Ligature*, I need not here dwell upon the subject. It is not meant to assert, that the use of a single ligature is never followed by secondary hæmorrhage, for this would be untrue. The constant I believe very occasional happen after this or any other mode, under common circumstances, and in very peculiar subjects. A fact of this kind we find recorded, which happened in the practice of a truly eminent and experienced surgeon—see A. Burns on *Diseases of the Heart*, p. 223; but from the inquiries which I have made, it appears to be proved, that catgut sutures, a single small ligature, applied with as little disturbance and disturbance of the artery as possible, will be more rarely followed by secondary hæmorrhage, than any, or than any other advantage. Thus, in the several cases reported by Mr. Norriss, the single ligature was never followed by any of those inconveniences, which, he justly thinks, will be met after this practice than any other. If the artery be not removed from its situation, or more detached than the ligature separates it.—(See *Med. Chir. Trans.* vol. II, p. 123.)

Before entering into the consideration of particular aneurisms, I wish to mention a few other considerations, worthy the attention of every practical surgeon. The first is the partial extrusion of blood into the aneurismal sac, after the artery has been tied at some distance from the tumour. This was first partially pointed out, and by reasons explained by Sir E. Home, who published three examples of its occurrence.—See *Praxis de the Improvement of Med. and Chir. Knowledge*, vol. I, p. 172, and vol. II, p. 329. But the circumstance had been, I believe, been recorded with due attention, and Mr. Hodgson made a one of the subjects of his reflections in his valuable treatise.

When an artery is tied close to an aneurismal sac, the extrusion of blood into the artery is almost certainly prevented; the coagulum which it contains is absorbed, and the coagulability of which the sac is composed, gradually contract, until the cavity is permanently obliterated. But when the artery is tied at a distance from the disease, the progress of blood into the latter is not altogether prevented; for the aneurismal branches which open into the trunk, below the seat of the ligature, convey a stream which passes through the aneurism. The progress of this current, however, is so trifling that the enlargement of the sac is only evident, but the depression of coagulum if it increases, in consequence of the ligature state of the aneurism. The coagulum sometimes is in the cavity of the sac, and the result of the artery ending up is, as observed, &c.—(See *Hodgson on the Diseases of Arteries*, p. 266.)

This fact, which is of great importance, both in a practical and pathological point of view, is proved by the post-mortem, 1st, by the occasional return of aneurism in the tumour after the operation; 2dly, by cases in which the cavity of the sac has been exposed, and hæmorrhage has been the consequence; and 3dly, by dissections, in which it has been found, that the cavity of the aneurism, as well as that of the artery from which it originated, was pervious, from the part which was obliterated by the direct operation of the ligature.

For a detail of the facts relative to this interesting point the reader is referred to Mr. Hodgson's valuable publication.—P. 267, et seq.

Some very interesting instances are recorded, in which the return or continuation of pulsation at the tumour is said to have prevented the cure, the aneurismal sac having begun to enlarge again. The two cases of this kind, however, which happened in the person of Peter and Giovanni (Trans. of a Soc. for the Study of Med. and Chir. Know., vol. I, p. 172; and Journ. de la Soc. de Med., No. 2, p. 107), cannot be very depended upon, as it may be doubted, whether the artery was really tied. Some better established facts, relating to this part of the subject, have been very recently published. One is a case by Dr. Meadell, 344, of Glasgow, which is very remarkable as the disease, viz. a popliteal aneurism, occurred six months after the femoral artery had been aneurismally and in the upper third of the thigh. On the 21st of February, 1815, this gentleman performed the operation, using a single ligature; the pulsation of the tumour in the femoral artery ceased; and the wound healed by the first intention, except where the ligature was situated, which came away in the fourth day. By this time, the tumour was diminished to one-half of its original size, and in two months more, only a hard knot was perceptible, in which no pulsation whatever could be felt. After the considerable lapse of time above specified, the patient suffered by Meadell, that the tumour had reappeared, being rather larger than a plum. The pulsation in it was distinct, though not so strong as in ordinary aneurisms. At the site of the swelling and strength of the pulsation increased gradually, a compress and bandage were applied without confinement; but as this treatment was ineffectual, the patient was afterwards kept in bed, tied, and put on a splint. A thick compress was placed over the tumour, and the limb was firmly bandaged from the toes to the groin. A trial of this plan for nine days not having produced any benefit, a tight bandage was applied over the femoral, but the pain was such in half an hour, that the instrument was taken off, from which moment no pulsation was felt. Next day the tumour not only did not shrink, but had a firm feel, and the bandage being continued, the cure was gradually completed. Had the disease not yielded to these means, Dr. Meadell meant to have tied the internal or external iliac artery, with the view of cutting off the supply of blood to the sac, through the anastomosing branches.—(See *Praxis Anæsthesia*, by Walker, p. 510—522, et seq.)

The following cases were mentioned by Mr. Astley Cooper: a man underwent the operation for aneurism; the femoral artery was tied; the pulsation ceased; and the patient in a little while was supposed to be cured of the aneurism, and discharged. Upon his return he labour, however, a swelling arose in the limb, without pulsation. The swelling subsided on compression of rest; but afterwards, while the man was at work, the swelling returned with great pain. At length, as Mr. Astley supposed that there was no prospect of the limb becoming useful again, it was amputated. Upon an examination of the parts, he found that the femoral artery, below the place of the ligature, had been secreting blood. It does now and then happen (says he) that a blood-vessel will arise from the artery close above the ligature, and pass into the artery distended; below it, by which means the circulation is produced. Mr. Astley then referred to a specimen in the hospital museum, where this fact is illustrated in the brachial artery.—(See *Lancet*, vol. I, p. 268.)

The external iliac artery was taken up by Mr. Norriss, of Bath, for the cure of an aneurism, and when the collateral circulation was fully established a few days after the operation, the tumour was again supplied with blood in sufficient quantity to pro-

draw a distinct picture, "a fact," says Mr. Norman, of gradual degeneration, as it shows that though the ligament on the first morning was the direct object of being torn into the artery, and is the cause by which the disease is cured, yet that there exists a necessity for following strict rest, the antiphlogistic regimen, and, in some cases, the abstraction of blood, to assist nature in her operation of obliterating the aneurism." And to remedy misconceptions, after that some gentlemen had thought the ligament artery to be the seat of organized aneurism, the following, though escaped for a time in the former, abstracted method, is such a degree, that some doubt was entertained whether the disease would have been cured by the ligature on the femoral artery, this not imagined and rather powerful proposition being adopted.—(Med. Obs. Trans. vol. 30, p. 31, 1835, &c.)

Dr. J. Hall, in a late work, has offered some criticisms on the English method of operating for aneurism. It is hardly necessary to be so much inclined to a very partial picture of these, however, when it seems, it was so manifestly not to be fully informed of all the facts and experiments recorded in the scientific treatise on aneurism by the late Dr. Jones. "Still less excellent than we are," says Hall, "in the treatment by compression, and in the use of ligatures remedied for the cure of external aneurism, the English surgeons have immediately recourse to the operation with the ligature. Haller's method is that which they universally practice. They will not even allow, that there are any cases in which the operation by opening the sac should be preferred. And it is singular, that very wise men, whose works would induce us in some cases of aneurism, properly so called, to adopt the operation of opening the sac, is alleged by the English surgeons as a circumstance in favour of the Hallerian method. Let us suppose an aneurism so formed, that near the centre of the tumour or rather near the opening, by which the artery communicates with the aneurism, are situated the pillars of the collateral arteries, which would be usual for the re-constitution of the circulation. Here it is clear, that in performing the operation by the Hallerian method, that is to say, incising the artery above the tumour, the most rational and the most significant, but the well-known fact branches of these collateral arteries. Let there be, for example, at the upper part of the femoral artery an aneurism, which, though formed originally below the origin of the profunda, now extends above it. Here it is manifest that in trying the femoral artery above the swelling, we should lose the important position of the profunda for re-constituting the circulation in the lower part of the limb. This is an old and long-suffering the aneurism would in such a case induce us to adopt the operation of opening the sac in preference to the Hallerian method; and Scarpa himself, as gentlemen advocate for that last mode. Scarpa, who seems only to have composed his work, to cry up this method, makes an exception of the case, which I have just been mentioning. The English surgeons, on the contrary, would urge the following objection to the operation by opening the sac in this and other analogous situations. They contend that the ligature would be applied too soon to the origin of the collateral arteries, which are to receive the blood after the operation. They are possessed with the idea, that when an aneurism is fixed at a given point, the two great proximalities of the principal collateral arteries disposed to extending aneurism." &c. (p. 255, 257) A circumstance which Dr. Hall seems to deny.

Now, before attempting to reply to these observations, we ought to know what exact distance Hall means, when he speaks of the profunda, or a large collateral artery, descending near the opening by which the aneurism communicates with the main artery. How far is not small precise; and were he to fix the femoral artery immediately below the point where the profunda arises, he would expose the point to great danger of bleeding. I say this, not aware of the case which he has alluded to, given the contrary. In the aneurism being formed, he applied several ligatures (p. 256), some of which were the ligature of aneurism, or some ligatures left ready to be tightened in case of need. These were of course higher up than the ligature which was tightened. It is therefore impossible, that this last should have been close to the origin of the profunda. There must have been some interval for the application of

the ligature artery; and, as it also manifested, that the French still persist in the use of large ligatures, and not small firm round ligatures.—See Humerlins. In this part of the Dictionary we shall find that the symptoms of a collateral vessel aneurism, the symptoms of the internal aneurism, which has a natural way in the process in which the artery is closed.

With respect to the circumstances of aneurism being cured by ligature when the aneurism is placed close below, that at some distance from a great collateral artery, there occurs in a double of the first. Four years in London, with an aneurism of this kind was cured, and has published in his book. It was a case in which Dr. A. Cooper had diagnosed the artery, as the subject died of hemorrhage a British aneurism, and, as opening the body, it was ascertained that an aneurism artery, which usually arises either from the trunk of the external iliac, or from the epigastrium, proceeded from the external iliac, and arose immediately above the point to which the ligature was applied.—See Partridge in Clin. Anglo-Am. in Clin. Trans. vol. 3, p. 278, 279.

From a preparation, spoken of by Mr. Treves, and some experiments made by the same gentleman, it would appear, that the presence of a collateral branch renders the formation of the internal aneurism, as well as almost prevent the closure of the wound in the adhesive inflammation. In the preparation mentioned, a ligature was applied to the external iliac, between the epigastrium and circumflex that aneurism, and having been in contact with the femur at the angle which it makes at its origin from the iliac, aneurism had taken place, and the bleeding had proved fatal. There was no coagulum formed in the trunk, though the operation had been performed several days, the circulation through the epigastrium having continued. But the branching at the seat of the ligature in the iliac artery was complete.—(Med. Obs. Trans. vol. 3, p. 255.) Indeed, it must be allowed, with this position, that the study of the blood vessel, present the adhesive process, a fact which, however, is as proved in the indirect abstraction of a vessel, by means of a temporary ligature or compression. What, therefore, the history of a large branch in the ligature is spoken of as a circumstance contrary to secondary hemorrhage, I mean, that it is as much as the internal aneurism is itself in promoting the closure of the vessel, and its formation is prevented.

Several facts, and afterward remarks, connected, that when an aneurism was so situated, that a ligature could not be applied to the artery leading to the swelling, a cure might possibly arise from tying the vessel on that side of the tumour which was most remote from the heart. Several experiments made by this means, the circulation through the sac would be stopped, so that in it would crystallize, that the operation would go on by the collateral arteries, and that the tumour would be finally absorbed. Dissection of the femoral artery below an aneurism aneurism, but the progress of the disease, instead of being checked, seemed to be accelerated by the experiment. The aneurism transpired, in a few moments, to open the tumour, and try to close up the vessel. At this moment the patient was in some quantity of blood, and died eight hours afterward.—See Clin. Obs. & Dissert. par Boissier, t. 2, p. 262, and Systeme Physiologique de Boissier de Médecine de Paris, t. 3, No. 17.

The operation of tying the artery below the tumour was suggested by Dr. A. Cooper, but he is an advocate of the femoral artery in the groin, but he is an advocate of the external iliac, when tying the artery where the swelling was, is particularly. The femoral artery was therefore tied immediately below Pott's ligature, between the origins of the epigastrium and the profunda. The pulsation of the tumour subsided; but on progress of the disease was checked. After a time, indeed, the swelling decreased, and this is incommensurable a measure, that hopes begin to be entertained that perhaps the external iliac artery might come about of being tied above the aneurism. The tumour came away without any unfavourable occurrence, and when the wound was healed, the patient was sent into the country for the benefit of the change of air. Afterward, however, the tumour grew again, an intervention of blood took place in the aneurism and caused death of the patient, and the patient died 31.

arteria innominata. The roots of the artery, surrounding the coagulans, were thickened to about four times their natural size, and lined by a thin layer of fibrine. Above the coagulans, the roots of the artery were thickened to the extent of at least six times their natural size, and, in addition, a layer of fibrine closely adherent to the outer surface of the artery, and continuous with that surrounding the coagulans at the lower part of the trachea, there were three other layers of coagulated fibrine.—At the upper part of the thickened portion of the artery, and just above the non-ligamentous, where the ligature had been applied, was an elevated swelling on the anterior and tracheal surface of the coagulated artery a quarter of an inch in length, and rather less in breadth, covered by a coagulum of dark-colored fibrine, communicating with the opening in the trachea. This case, according to my judgment, might be reserved as another proof that Brashear's method is capable of producing those changes in the coagulans, artery, and circulation, which, if not succeeded by some accidental backward occurrence, like the ulceration, leading in this case to fatal hemorrhage, may bring about the perfect cure of the disease.

If my doubt remained of this fact after the case already cited, it would be dispelled by the results of some other fruits of the procedure, and more particularly by the history of the case of Mary Davis, aged 26, on whom Dr. Hinkle (now Professor at Anatomy and Surgery in Rutgers Medical Faculty of Geneva College, New-York) operated, under very trying and difficult circumstances, with great skill and complete success.—(Lancet, vol. 4, 1856.) The tumor extended from the clavicle on the right side upwards nearly to the axilla, pressing the trachea towards the opposite side, and passing under the sterno-clavicular articulation to nearly an inch beyond its lower border. For many days previously to the operation the patient had not been able to swallow any thing; her respiration was dangerously obstructed, and her voice faintly lost. In the operation the artery immediately above the aneurism was found dilated, not more than half an inch of its extremity being sound, and on this a single coil of ligature was placed. As soon as the artery was tied, the fibrine became softer and less compressible, and though she had not swallowed any thing for nine days, she took, before the wound was dressed, about the amount of wine and water. The operation was performed September 11th, 1857. April 16th, 1858, the woman was in perfect health. There was then scarcely a remnant of the tumor; the remarkable anorexia of the breast had ceased; and respiration and deglutition were natural. As Mr. Wardrop remarks, the facts recorded prove beyond all dispute, that we have growth of no mechanical nature may be arrested, and the disease cured, by placing a ligature on the distal side of the sac, especially if we branch of the artery intervenes between the sac and the ligature; or if a considerable branch, and one that afterwards enlarged sufficiently, were to be in this situation, the operation would have little or no effect in producing any diminution of the expansion of the blood in the aneurism, from the fainty of which the blood would pass as freely into the enlarged branch as it previously did along the trunk itself. Hence we see why Brashear's operation will probably be attended with great or success in cases less than other aneurisms, the common carotid artery giving off in its course no branch which might interfere with the principle of the cure.

Professor Hinkle being now engaged in treating aneurism and aneurism in this city, has kindly accorded me the request in forwarding me from his note-book, the following case, the principal symptoms of which are similar to this patient's, viz. in a place here. It is related in the *Lancet*, No. 244, vol. 2, May 26, 1856.

"A *chief fact* that can lead to prove or disprove an aneurismal point must be considered study of local valvular, it may not be useless to suggest a case of aneurism of a patient who in the summer of 1855, was admitted into the Westminster Medical Hospital, Dublin, under the care of Dr. Casper. His complaint was aneurism, was registered as phlegmasia of the right arm, but a large vessel being discovered in the axilla, the late Professor Todd was called to see the patient; and after careful examination he gave it as his opinion that it was an aneurism, which, from its magnitude and local situation, was to some the point, he perceived it, and found blood followed the insertion of a probe. When

passed upwards for about three inches, the valve of the sac being divided, the man was removed to the Westminster Medical Hospital, where, from a shock of any vessel consequent on the puncture, he died in a few days. Mr. Todd requested that I might examine the body, and from notes made after the dissection I abstract the following: "The aneurism, which was of large size, occupied the right axilla; the sac in some places was almost absorbed, and adhered freely to the upper and outer part of the artery; when opened, it contained large quantities of laminated fibrine, and in its centre was a cavity holding about eight ounces of coagulated blood; communicating with the artery, there was an opening of one-eighth of an inch in the axillary artery, below which the vessel was obliterated for the space of half an inch, corresponding to the situation where the sac naturally occurred.—There then was a case where the aneurism was undergoing a spontaneous cure in consequence of the pressure of the tumor having obliterated the artery on its distal side, and I took upon it as a valuable fact towards settling the nature of entering the operation of Brashear and Denham; and so much was I impressed with the efficacy, that before Mr. Wardrop published his essay, I recommended the operation in a case of large aneurism in a public hospital; but my name was to be forgotten. However, when I again met the two surgeons who so warmly collected me, it will be my turn to laugh in tears."

Mr. Wardrop himself regards Brashear's operation as too strictly applicable to aneurisms in which it is impracticable to place a ligature on the radial side of the sac, but so likely to merit the preference when the tumor is large, and likely to enlarge after no conclusion through the sac is interrupted. This inference is drawn from the fact of the immediate diminution of the swelling, which has usually followed the application of the ligature on the distal side of the aneurism. It also seems probable that in this method there is less risk of hemorrhage from the part of the vessel in which the ligature is applied than in the Brashear operation. On the principle that it is sufficient for the cure of an aneurism, and the importance of the blood through it diminished, as the deposits of laminated fibrine within the sac will then increase, Mr. Wardrop urges the propriety of extending Brashear's method to aneurisms of the axilla; aneurisms; but the very pressing and valuable cases which he has achieved in confirmation of his views of these particular aneurisms will be more convincingly noticed in the sequel. As an advance of the improvement of surgery, I must not quit this part of the subject, without expressing the conviction that sympathy of the service which Mr. Wardrop has rendered the profession and the public by his able and enlightened view of a valuable operation, which would his exertions and example might long have remained quite forgotten, or, briefly mentioned in the history of surgery and dangerous proceeding, scarcely of further trial.

[This suggestion of Mr. Wardrop has been acted upon by D. Evans, Esq., surgeon at Dulpar, Derbyshire, who successfully tied the carotid aneurism of the innominate and root of the carotid. The details of this successful operation are so convincing, that I cannot withhold from the profession the record of this highly important and successful branch of modern surgery over this most terrible disease. It is extracted from the *Lancet*, No. 271, vol. 3, Nov. 9th, 1856.]

"William Hall, aged 30, a laborer and horse-dresser, an athletic and spirited young man, about five feet six inches high, has been accustomed to laborious work, frequently rising from 70 to 100 miles a day, and has always enjoyed excellent health until the appearance of the following symptoms.—About 14 months ago he was seized with symptoms of breath, troublesome cough and tightness over the chest after much exertion, especially at walking fast to a hill.

These symptoms continued until the 10th of March, when he had an attack of hemorrhage, which he attributed to cold. The expectoration was copious, consisting of masses slightly streaked with blood, and his weight some six or seven pounds, which were followed by a sense of weakness.

On the 10th of March, after a day of coughing, a swelling appeared about the size of a walnut suddenly on its appearance behind, and extending a little above the right sterno-clavicular articulation, and

covered externally by the internal portion of the normalised intima. The aneurism was greatly diminished by firm pressure, but could not be made to disappear entirely.

The pulsation of the tumour, which was synchronous with that of the heart, was increased in force by pressure upon the right subclavian artery, and was diminished and sometimes completely arrested by pressure upon the right carotid above the tumour.

The pulsations of the right carotid and subclavian arteries were stronger than those of the left; still there was no apparent difference in the pulsations of the radial arteries.

As soon as the tumour made its appearance, the cough and dyspnoea ceased to be troublesome, and the health was soon re-established. His sleep remained well upon pressure, and the respiratory function well definitely heard all over it. No systematic pulsation could be detected by the use of the stethoscope between the tumour and the heart. A loud and powerful pulsation was heard over the tumour, unaccompanied with any tremulous sound.

In taking into consideration the situation of the tumour, its sudden appearance after a violent paroxysm of coughing, and its well pulsating character, together with the symptoms above enumerated, little doubt could be entertained of its nature, and I concluded that the root of the carotid artery was the seat of the disease.

Considering this a favourable case for the operation, I was induced to obtain the opinion of Mr. Woodroffe, lately retired, and so very celebrated by Mr. Woodroffe, I was induced to obtain the opinion of two retired surgeons at London respecting its propriety. Both, however, disapproving of the operation, it was therefore determined, with the approbation of my friends, Mr. Bennett and Mr. Brown, of Dorset, that a far more should be made of Velpeau's plan of treating aneurisms.

The nature of the disease was fully explained to the patient, who fortuitously was a man of strong sense and most determined resolution, and from his employment leading him to study the diseases of horses, there was no difficulty in making him comprehend the dangerous tendency of the disease. He therefore embarked with perfect confidence in the proposed plan of treatment, and I cannot sufficiently express the gratitude and cheerfulness with which he bore the long privation which it was necessary to enforce, and the implicit faith which he placed in all the remedies adopted for his relief.

April 3. He was accordingly ordered to bed, as he had to the extent of eight weeks every third day; his diet to consist of small quantities of gruel, broth, and tea. Small doses of digitalis were likewise administered. This plan of treatment was continued until the 13th of July. During the first month there appeared some little improvement; his pulse was frequently as low as 47 in the morning, the tumour became harder, its pulsations less frequent and more prurient; those which it was supposed that coughs might be hearing. The blood吐eritis had become seriously healthy, and it was noticed that if the bleeding were delayed beyond the usual time, the symptoms were aggravated.

In the beginning of May a great attention to the worst took place, which was supposed to be owing to his taking a small quantity of animal food. The blood after each bleeding became buffed, pulse 80 in the middle, the tumour slightly increasing in the course of a few days, and becoming very painful upon pressure. Twenty leeches were applied without any effect. A few days afterwards a diarrhoea supervened, the inflammatory state of the tumour abated, the pain ceased, and the swelling in some degree subsided. After this much his pulse was never less than 60 in a minute, although the same plan of treatment was rigidly adhered to.

From this time until the 1st of July the tumour remained stationary; but from the latter date until the 20th he gradually got worse, the tumour increased, and was reached as high as the crooked cartilage, and by its pulsations upon the trachea and mediastinum partially impeded respiration and deglutition. His stercoraceous, which, prior to his illness, would have been constant, ceased and now he made to meet by more than three times; his countenance became flushed; pulse more feeble; and it was evident that the lowering system had been carried as far as it could with safety.

Under these circumstances the operation was recom-

mended as the only remaining chance. Its advantages and disadvantages were fully stated, and the chance of success, although small, made him anxious that it should be performed. Dr. Bennett, of Dorset, saw the patient on the 11th, and concurred in the propriety of the operation as a last hope.

On the morning of the 23d of July, the day proposed for the operation, the patient became so anxious that the pulsations of the trachea, of the heart, and the large arteries, especially the subclavian, were well perceived by the eye. The operation was performed in the presence of Messrs. Bennett and Brown, of Dorset; Mr. High, of Ashby-de-la-Zouch; and Mr. Walter, of Chancery Lane, surgeons.

In consequence of the tumour extending as high up the neck, there was some difficulty in getting down to the sheath of the artery, which was opened to the extent of half an inch. The artery appeared healthy, and was easily secured by a single ligature of strong silk.

Immediately after severing the ligature the pulsations in the different branches of the subclavian carotid artery ceased, except a slight fluttering in the extreme branches of the temporal. The pulsation of the carotid continued without diminution.

24th. Both. He went on well. The pulsation in the trachea was stronger than it was before the operation, and the pulsation of the right radial artery was observed to be more forcible than that of the left.

25th. He became feverish; pulse 120, and full; the right leg of the wound swelled and painful. Six ounces of blood were taken away from the arm, and some saline medicine administered. The blood was much buffed.

26th. Morning. Much better; pulse 92, stronger in the right radial artery than in the left; pulsation in the trachea still very forcible.

Evening. The fever and pain in the wound returned. He was again bled. Blood still buffed.

27th. Better again this morning. He was taken twice at nine o'clock in the evening. Pulse 100; delirium; anxious countenance and sickness. No distinction in the size of the tumour.

28th. Much better, and continued so all day.

29th. At seven a. m. he was taken suddenly worse, and appeared to be dying; his countenance ghastly, and covered with perspiration; tracheal rattle, and inability to swallow. He appeared comatose, but could only speak in a whisper; pulsations in the trachea still forcible; the pulse in the right radial artery scarcely perceptible, while the left pulsated as strongly as it did the previous day. These symptoms were accompanied with a profuse perspiration. He remained in this state for several hours, at the expiration of which time he rallied; and by the evening (with the exception of the salivaceous, which continued) he appeared quite as well as on the preceding day.

As he continued to improve from this period, it will not be necessary to enter into a daily report of the case. I shall therefore confine myself with noticing the most prominent symptoms which occurred. One of the most remarkable was the obliteration of the arteries of the right arm and forearm, which was first observed in the arteries of the forearm on the 13th of July, the eighth day after the operation; for until that day the arteries of the right arm pulsated with greater force than those of the left. The process of obliteration was attended with severe paroxysms of pain, chiefly felt in the course of the brachial and axillary vessels.

The brachial artery after its obliteration was hard and painful to the touch, and felt very like an inflamed abscessed vessel. The right arm wasted, and became gradually paralyzed, and continued to diminish for three weeks; at the expiration of which time several uncomfortable breeches were observed pulsating on the back part of the arm. As these vessels enlarged, the limb improved very slowly, but having yet (18th) perfectly acquired sensation, nor its previous power of obeying motion.

On the 11th day after the operation, he was attacked with interesting paroxysms of pain in the right side of the head and face, of the same character as the pain in the right arm, though not so violent; this pain ceased within a fortnight. The right side of the head and face became emaciated, and very few looking at him would immediately discover that the right half of the face was much smaller than the left. The blood having since found its way into the temporal and facial

the same success (vol. vi. p. 37), and a case in which thrombosis effected a cure by compression: the femoral artery by means of an instrument applied just above the place where thrombosis produces the closure of the disease, aneurism is treated by Bandeau.—(Fr. Journ. of Med. Bandeau's work, t. i. p. 314, 315.)

The aneurismal tumor which the rupture of a transverse aorta affords the first stages of aneurism have been already mentioned, as well as the presence of aneurism in the placenta, perfect aneurism, Venous aneurism, aneurism of the heart, and other aneurismal affections, especially in, which was first communicated by Richard Meigs, and subsequently (Widd) proved by Rokitnik.

Aneurism, in general, and among them the popliteal aneurism, are attended with some of the signs of a spontaneous cure, yet also denote a want of the cure: it is in a false way, rather for the purpose of the operation, especially as it is the usual source of the disease to continue in progress; while in the early stage the cure may be more speedily accomplished. In fact, the experience of modern operators leaves no room for supposing that the aneurism will not suffice for the due treatment of the leg, and consequently prove that waiting beyond a certain time for the cure of the popliteal aneurism to take place is altogether an unnecessary and disadvantageous method. Popliteal aneurism, as well as other cerebral aneurisms of the same nature, attend the first stage of a spontaneous cure, when any other disease is general, violent, and deep inflammation all over the body; for then the communication between the sac and the artery is likely to be closed with coagulating lymph, and the pulsation of the tumor to be suddenly and permanently stopped. If in this state the disease deepens, and the patient's constitution fails, the coagulated mass in the sac and the thrombus are gradually detached, leaving a deep ulcer, which ultimately heals. An example, in which a popliteal aneurism was cured by such a process, is related in the *Trans. for the Improvement of Med. and Chirurgical Knowledge*, vol. 3, p. 316.

In former times, when all hopes of curing a popliteal aneurism by Talbot's method, by compression, or a natural process, were at an end, surgeons of the high was considered as the safe and necessary means of saving the patient's life. But about fifty years ago, the confidence of surgeons in the efficacy of the compressing means or the contraction of the stricture began to increase, and, in opposition to the tenets of J. L. Petit and Pott, experience was proved, that in general, not only might the patient's life be saved, but his limb also, and this without any operation that could be compared with amputation in regard to safety. On looking back to the history of aneurism, we shall find that A. N. Garengeot was one of the earliest writers who disapproved of amputation as not truly indispensable for the cure of popliteal aneurism.

It is alleged that Teislere, Myrdell, Goussard, Maubert, and some other celebrated Italian surgeons, were the first who refused to be the popliteal artery for the cure of aneurism. The path, as Pelisson remarks, had been pointed out to them by Winslow and Halber, whose valuable description and picture of the arterial aneurism about the knee-joint, showed by what means the lower part of the limb would be preserved, while the upper had been placed in the principal arterial trunk. For almost thirty years, however, the opinion of treating the popliteal artery was confined to the Italian surgeons. Philippe Rivier held the view that the first was attempted took its origin at Paris nearly thirty years ago (relating to about the year 1780) the *Journal Chirurgical* being dated 1810.

However, the operation of opening the femoral and tying the internal artery itself, was a severe and often fatal proceeding, and even not aware of being compared with the Hæmorrhoid operation in most cases of aneurism, many of aneurism, as I shall explain, after the time of a few particulars relating to the popliteal aneurism.

On the lateral side of the artery the thrombus is produced, it can be easily felt in the hollow between the hamstring, and as general its nature is as easily ascertained by the pulsation in every part of the femoral. Though the disease may not occur in the popliteal artery as often as in the same limb it certainly is seen more frequently in the femoral region than any other branch which the artery sends off. As Dr. J. Home

has observed, this circumstance has never been satisfactorily explained; and, what is rather curious, in many recent instances of this disease the patients have been mortally and positively. Morgagni found aneurisms of the aorta most frequent in glands, psoas, and other persons who sit almost wholly on horse-back; a fact, which he ascribes to the concussion and agitation to which such persons are exposed. Some allusion to this subject has already been made in the foregoing pages. Whether an explanation of the frequency of popliteal aneurism can be correctly referred to the alteration which the circulation in the artery itself experiences when the limb is in a state of flexion, may be questioned, though it is on a similar principle that the great frequency of aneurism of the carotids of the aorta is attributed to be solved.—(Hence in *Trans. for the Improvement of Med. and Chir. Knowl.* vol. 1, 4, 5, and *Notes in Ed. Med. Essays* vol. 5.)

Were this the only, or even the principal cause, surely one would have reason to expect aneurism to be at least as frequent in the axilla, and in the bend of the elbow, as in the knee.

The popliteal aneurism was generally supposed to arise from a weakness in the coats of the artery, independent of disease. If this were true, we might reasonably conclude, that except in the distal part the vessel would be sound. Thus the old practice of opening the sac, tying the artery above and below it, and leaving the bag to exsufflate and heal up, would naturally present itself. As the arterial coats were found to be altered in structure higher up than the tumor, and the artery manifestly above the sac seldom failed when tied, that when the ligature came away, the patient was destroyed by hæmorrhage. Mr. Hunter concluded, that some disease affected the coats of the vessel below the natural occurrence of aneurism. Dissatisfied with Haller's experiments on frogs, showing that weakness alone could give rise to aneurism, he tried what would happen in a quadruped, whose vessels were very similar in structure to the human. Having divided above an inch of the carotid artery of a dog, and removed its external coat, he dissected off the other coats, layer after layer, till what remained was so thin, that the blood could be seen through it. In about three weeks the dog was killed, when the wound was found closed over the artery, which was neither increased nor diminished in size.

It being conjectured that the prevention of aneurism, perhaps arose from the parts being incessantly laid down on the weakened portion of the artery, Sir E. Jones stripped off the outer layers of the femoral artery of a dog, placed first over the exposed part of the vessel a piece of flannel, and then the sides of the wound, and in six weeks killed the animal and opened the artery, which was neither enlarged nor diminished, as often having replaced their natural thickness and appearance.

These experiments strengthened Mr. Hunter's belief that structural arteries are diseased; that the natural affection frequently extends a good way from the site along the vessel; and that the cause of failure in the old operation arose from tying a diseased artery, which was incapable of tightening before the ligature was removed. Those authorities led him to propose taking up the artery in the healthy part of the thigh, as were distant from the diseased portion, so as to diminish the risk of hæmorrhage, and to enable to get at the vessel again in case it should bleed. The success of blood tied into the sac being stopped, he concluded that the sac and its contents would be absorbed, and the vessel gradually disappear, so as to render any opening of it unnecessary.

Dr. David Hewson was the first surgeon who performed this operation in America, which he did successfully as early as 1808. Three cases of aneurism were cured by him, by the ligature of the internal artery, and will be found reported in his valuable volume of "*Essays on Medical Science*," by which it will be seen, that this distinguished physician in the latter part of his life was an ardent supporter of more than ordinary skill. The two science devoted labors, in teaching the theory and practice, and in the most extensive character of a general practitioner has acquired a reputation second only to Rush, with whom his name will be transmitted to posterity as being the most eminent in their profession in this or any other

the wound. Scarpa's reason for this practice is to avoid the necessity of removing the sartorius muscle too much from its position, or of turning it back, to bring the artery into view, so as to be tied. I have seen the best operators, even professors of anatomy, embarrassed by having the sartorius muscle immediately in their way after the first incision; and as the vessel is more superficial a little higher up, the plan is further from the divided part of the artery, and there is no hazard of the anastomosis failing to keep up the circulation. This part of Scarpa's practice is highly deserving of imitation.

The part of the artery (observes Mr. Hodgson) in which the femoral artery can be tied with the greatest facility, is between four and five inches below Poupart's ligament. The profunda generally arises from the femoral artery in such a way as to be an inch, and three-quarters below Poupart's ligament at very nearly right angles to the main trunk. It therefore, the ligature is applied to the femoral artery at the distance of four or five inches below Poupart's ligament, the surgeon will not be embarrassed by meeting with the profunda during the operation, and the chance of causing secondary hæmorrhage, by tying the artery close to the origin of this vessel, will be obviated.—(On the Diseases of Arteries, &c. p. 431.)

The incision being, however, too low down, so as to have the sartorius intervening between the external wound and the artery, may be more accurately estimated, when it is known that Desault, in the treatment of this aneurism, considered it right, actually to make a complete transverse division of that muscle, a thing which, it is said, may be done without any ill consequences.—(Rogee, Traité sur Mal. Chir. t. 2, p. 105.) I shall not presume, however, to record this last piece of advice, because, though it may have been done by Desault, it appears to me that the artery can always be taken up very well without the preceding last measure being used.

A few years ago Mr. C. Blandin published a paper, in which he advocates for the practice of making the incision at the outer edge of the sartorius, and then raising that muscle and drawing it upwards, in order to bring it to the artery. This advice proceeded from the apprehension that the plan of taking up the femoral artery at the inner edge of the sartorius was attended with risk of injuring the profunda vein, and large hæmorrhage.—(Lectures on the Operation for Popliteal Aneurism, 1811.) The same method is recommended by Hager and Boerhaave.—(Observations Med. sur le cancer, t. 1, p. 125) when the aneurism is done low down in the thigh. But in operating in this situation is liable to the several objections of approaching too near the distance of avoiding taking up the artery where it lies close to the bone, that it does higher up, and of every inconvenience which may arise from the incision, dissection, and reflection of the sartorius muscle, the method must be rejected, unless it can be proved that so many disadvantages are fully counterbalanced by other considerations. If the plan which I shall presently recommend be adopted, there will never be the slightest risk of wounding the profunda vein; and, therefore, I do not consider it advisable or necessary, for the avoidance of this accident, to make the incision precisely upon the sartorius, as my intelligent friend Mr. Hodgson suggests; a method attended with the inconvenience of having the fibres of that muscle between the external wound and the artery, and perhaps inconsistent with the excellent directions which he at several deliveries concerning the right mode of performing the external incision, when he says, with Scarpa, that this cut should be “continued down to the bone, which from the inner margin of the sartorius.”—(On the Diseases of Arteries, &c. p. 431.)

Now, if the point where this margin first lies over the artery be the proper place for the lower incision of the external incision, we shall clearly be deviating from the precise course of the vessel by letting the higher portion of the incision be over the fibres of our muscle. And when it is further reflected, that the serious risk of wounding the trunks of the lymphatics in this operation are not demonstrated in modern practice, while the profunda vein may always be avoided with certainty and facility, I cannot admit, that there is any solid reason for letting the position and direction of the external wound be determined by such apprehensions. At all events, for the reasons

above explained, it should be a fixed maxim in this operation, never to extend the wound lower than the point where the inner margin of the sartorius crosses the artery; and from all conclusions and displacements of this muscle will be unnecessary, and every circumstance which might proceed from its interposition between the outer wound and the artery, will be completely avoided.

With the view of preventing injury of the femoral vein, Mr. Camichael recommends the needle to be introduced on the outer side of the artery, where the vein presents itself to view, and can be most easily avoided. He remarks, that the only part of the thigh from Poupart's ligament to the level of the trochanter, in which the femoral vein is not completely covered by the artery, lies within the space which extends from Poupart's ligament to the point where the artery meets the sartorius muscle. At the part of this space most distant from Poupart's ligament, the vein begins to become small at the point-side of the artery, does not branch, and it emerges more and more as it ascends.—(See Tronc, &c. of the Femoral, &c. of the King's and Queen's College of Physicians, Ireland, vol. 1, p. 325.)

The skin and cellular membrane must be divided in the situation, and to the extent above specified, down to the femoral fascia, under which the artery lies, and may be felt beating. The next object, therefore, is, to divide the fascia, which is here with thicker than at the outer side of the thigh, and may be cut with some care close to the artery; or (which is safer, with the view of abstracting from all chance of wounding the artery,) a slight cut may first be made in the fascia, the division of which may then be made to the requisite extent by withdrawing under it a pointed dissection, on which the further incision may be made with perfect security. The fascia is to be divided in the direction of the external wound; but to what extent, is a point on which surgical writers differ, and, indeed, they must here differ, so long as they are not unanimous about the method of applying the ligature round the artery; because if it is intended to use a ligature, with a cylindrical piece of linen interposed between it and the artery, or especially if it be designed to apply two ligatures and divide the vessel in the interposition, more of the fascia must be exposed, and of course more of the fascia must be cut, than when it is simply meant to surround the vessel with a single annular ligature. Both opportunities are here suggested, the pernicious habit of isolating the artery all round, without any to be then thrust their fingers under it, will likewise require an extensive opening of the fascia. This dissection of the vessel for an inch or more, for the purpose of placing the ligature under it, is a measure which deserves to be considered in the strongest terms, as it is the very thing which produces some risk of injuring the profunda vein, and has a tendency to bring on secondary hæmorrhage, inasmuch as it is essentially unnecessary lacerating, stretching, and distending of the artery and surrounding parts, and an inevitable division of the vessels by which the arterial canal is supplied with blood.

According to Mr. Hodgson, the extent of the cut in the fascia should be about an inch; he is wholly devoid of all unnecessary separation of the artery from its surrounding parts. On the contrary, Scarpa, who contradicts and proves the vessel, generally to hang its loose part upon the profusion of cutting the fascia the whole length of the external wound; for, says he, if this practice be neglected, it most frequently happens, that in the succeeding inflammatory stage, the bottom of the wound swells and becomes very tense, and the matter which is formed under the fascia, not finding a ready exit, sometimes abscesses which seriously retard the cure. But Scarpa, instead of planning a method of relieving the consequences, might have surprised him self were he the purpose in considering how they were to be prevented, and why is his method they most frequently happen. Now, without lagging any more upon this wanted ligature, such composed of six threads, with an additional catgut suture between, viz. a roll of linen, in the course, we should be more surprised to hear that the wound after his method did not become affixed with swelling, tension, and suppuration, than that these were the usual effects. After describing the division of the fascia, he observes: “With the point of the fore-finger of the left hand, strongly touch-

ing the femoral artery, the aneurism will separate at first the radial or subclavian, which sits at internally and posteriorly to the subclavian vessels; and making the point of the artery itself pass gradually under and behind the femoral artery (supposing the aneurism has not uncommonly long projected), he will raise it above from the bottom of the aneurism, or (what is found to succeed) slide with the femoral vein. If it sliding with the femoral vein, the aneurism, hold, one the artery and pass this round, and almost out of the wound, then externally separate the vein from the artery with a knowledge of position, or simply with the finger. *See on this subject a dissertation, p. 260, ed. 2.*

When we consider the irritation and mischief of all the weak vessels in effects of blood, the bottom of the wound with out it, I would ask, what unnecessary passages through any other person have suggested by bringing on the suppurative state of the wound which for centuries as well frequently taking place?

I shall suppose the aneurism has not been divided, in order which the surgeon continually feels the pulsation of the femoral artery, which is still, impeded by the cellular sheath. The femoral vein has directly under this vessel, while the pulsation of the anterior cranial nerve, separated from it by dense cellular substance, are more externally, yet somewhat more deeply situated. The next object, therefore, is to pass a single ligature round the artery, without including, or in any manner meddling with, the adjacent blood vessels, or extending and disturbing the artery. For this purpose the best direction is now given by my friend Mr. Lawrence, especially when combined with Mr. Carcass's plan of leaving the needle be introduced on the paler side of the artery: "after directing down to the artery, a slight scratch or incision may be made through the sheath, close to the side of the wound. Then, with a narrow aneurismal needle, partly pointed at the end, and made so thin at its eye as it can be without cutting, a single silk ligature is to be conveyed round it, the point of the needle being kept in contact with the artery. A needle of this form makes its way easily through the cellular substance, and the vessel is detached only by the track of the instrument." (*See Med. Clin. Trans. vol. 6.*)

If the kind of ligature to be employed, I need not say here, that it should be a single one composed of fine materials, in order to avoid the necessity for excising its filament near where would be desirable for persons elsewhere considered.—*See Memorials and Ligatures.* The ligature having been put under the artery, one end of it is to be drawn completely through the track made for it by the needle, which instrument is then to be taken away, leaving the ligature under the vessel. The ligature is now to be tied in a steady, firm manner, but without any excessive force, which can never be necessary even for the division of the artery some of the vessel. In this part of the operation, a few practitioners give the preference to what is termed the surgeon's knot; and commend the plan of leaving the ligature a plan which consists in passing the end of the cord over through the aneurism, under the constriction as made. The only good of the surgeon's knot is, that it does not so readily slip and loosen as a common one; but Scarpa thinks a single knot best, as it does not, like the other, prevent the surgeon from catching the fibre with which the artery is connected.—*See Memorials, p. 20, ed. 2.* And besides the knot around the surgeon's knot, another operation is to be the irregularity with which a ligature with the force will round the vessel. A single loose slip of thread is first made and tied round, and then a second one, so as to form a second knot; and now, as a matter of precaution against the possibility of the ligature slipping and loosening from the surgeon, if the patient, can tie the knot once more. One end of the ligature is now to be cut off near the knot; and the sides of the aneurism are to be brought together with strips of adhesive plaster, the division of vessels being carefully avoided. The remaining end of the ligature should always be brought out at the external point of the external wound in the knee of the artery.

The effects which in general immediately follow the operation are, a suppuration of the part, or of the aneurismal sac; a suppuration usually, and therefore of the swelling; a fluctuation in pain, which is not

the failure; and a strong vibration of the aneurism as it is moved round the knee. As Mr. Hodgson has remarked, the natural influx of blood into the aneurismal sac, when a small artery is suddenly aneurismal, is generally attended with a considerable increase in the temperature of the part. After tying the femoral artery for the cure of popliteal aneurism, the same phenomenon occurs, so that after a short time, during which the temperature of the leg and foot frequently continues lower than that of the sound limb. But in a few hours it generally rises, and is sometimes several degrees higher than that of the opposite limb. This state lasts several days, at the end of which time, the heat of the limb which has been operated upon will be found to be about the same as that of other parts of the body.—(*Memorials, Dissertation of Aneurism, p. 258.*) It is only while the limb is colder than natural, that it ought ever to be freckled or covered with flannel. In particular examples, there is an increase of temperature in the limb, at any period after the operation; a heat which Mr. Hodgson ascribes to the probability of a venous circulation having already been established in consequence of the obstruction to the passage of the blood through the femoral artery; by the accumulation of the circulation in the aneurismal sac. Of course, unless a collateral circulation be established, the aneurism cannot succeed, as the limb will mortify; it follows me, therefore, to be aware of the circumstances which may prevent the transmission of the blood to the aneurismal part of the limb. These are fully explained and enumerated upon in Mr. Hodgson's work: 1st. An extensive inflammation, by which the principal anastomosing branches are divided. 2dly. Tight ligatures and pressure operating so as to obstruct some vessels. 3dly. The intense heat of the tumour, and the pressure upon the principal anastomosing arteries. 4dly. Callosities depositing in the coats of the arteries of the limb. 5dly. Advanced age. A languid state of the circulation, a fact indicating the weakness of venous action, as a general practice after the operation, though it may yet be right to adopt this treatment, where the pulsations return in the tumour with increased strength, and appear to stop the discussion of the swelling, as already mentioned. 7thly. The absorption of heat from the limb by cold evaporating lotions; a plan which can only be right when there is a good increase of heat in the limb, a tendency to inflammation, or a return of other pulsations in the tumour.

So Asley Cooper uses a cloth which the application of seawater occasioned mortification and the patient's death. In cold weather, he always covers the limb with flannel or a stocking, and sometimes puts powdered with hot water to the foot.—(*See Memoirs, vol. 2, p. 42.*)

When the operation is done according to the principles laid down in this article, the patient is not too old, nor unduly, and the after-treatment is properly conducted, mortification cannot now be said to be a frequent event. In one case, reported upon by the Asley Cooper in 1821, the whole of the face and part of the leg mortified; but it should be noted, that in this instance the whole limb was extremely swollen previously to the artery being tied.—(*See Memoirs, vol. 2, p. 43.*) In all his extensive practice, he has seen but three or four instances of a slough of the operating integuments.—(*See Memoirs, vol. 2, p. 43.*) Mr. Cooper has related one example which is described in the appendix of an account with hot and water.—(*See Memoirs, vol. 2, p. 43.*) As, however, the aneurism never so large from a very oblique diameter, and to have been treated with intussusception of other parts, the reality of the slough seems to me highly likely. I have seen but one example of gangrene, and in that, only one toe, and a portion of the skin of the aneurism, occurred in a very detached subject. This painful progress of the foot has been particularly noticed by Deschamps and Scarpa, the latter of whom remarks it as an unusual thing, only likely to happen in old, weak, or naturally debile; and "as any rule (says he) if it should happen in any of these persons, the patient may prevent it by using themselves for the foot of one or two of their toes, with the view of a partial amputation, and the treatment of a partial and detached aneurism in the knee, and of the intussusception which would have followed it."

So Asley Cooper has known instances of gangrene brought on by the operation in one or two examples, and the toe

of the effusion is indispensable.—*Edinburgh, &c. vol. 3, p. 26.* Mr. L. first cut with a razor to which the aneurism artery divided below the profunda, the two open vessels, the most superficial of which was a thick natural and soft in the operation. The patient died of constitutional debility, arising from indigestion in the whole course of the cure. After two or three days, the pulsation of the tumour, which had been very strong, ceased; it was thought of its absorption in the blood within the six (another fact, some say, that this desirable change will not be prevented by a vessel of blood being introduced into the aneurismal cavity).—(*New Quarterly Journal, vol. 2, p. 167.*)

Mr. Lisson has recorded a case, in which the pulsation and tumour returned several months after the operation. "On consulting with Mr. Thomson, it was agreed to try the effect of methodical bandaging, from the point of the toes upwards, and a compress over the tumour, with rest, cold applications, and moderate diet." These means had the desired effect, and the patient did not complain much of three years, which is frequently remark after the operation for aneurism.

According to Mr. Lisson, these vessels are in general directly referable to the sympathetic nerve, and its branches, and are explained by the state of the vessels in the substance of the nerve. "In the natural state the arterial vessels, when injured, are as large as a writing quill; but when the replacement of the natural branches is requisite, owing to the obstruction of the trunk, they also are called on to contribute their share to the new circulation; and they become extremely distended. In one remarkable instance, in which the limb was injured and exposed fifteen years after the vascular fracture, very bad lesions occurred far removed from the limb, the vessels in the sympathetic nerve had attained the size of cranial quills, and were convoluted in an extraordinary manner. The pulse in the limb, noticed by Mr. Lisson on coming after the operation, he acknowledges, however, are by no means so severe as those experienced previously, and which are produced by the compression and stretching of the nerves by the scar."—(*Edin. Med. Journ. No. 34, p. 2.*)

When the operation succeeds, a considerable portion of the artery above the aneurismal tumour is rendered impervious, the vessel indeed being sometimes converted into a solid cord, and some of the profunda to the of the iliac arteries.—(*J. Cooper, Med. Cas. Trans. vol. 2, p. 251.*) In practice, however, the obliteration of the artery is less extensive; a fact particularly noticed in one of Mr. Hunter's cases (*Tracts of a Society for the Improvement of Med. and Chir. Knowledge, vol. 1, p. 155*), and wisely argued by Blandin as a result of the insufficiency of the new method. (See observations of Blandin on the Ligature des principales Arteries Majeures, et particulièrement sur l'artere aorte, *Chir. Expérimentale, p. 36, Paris, 1787.*) It appears from the observations of Mr. Hodgkin, that the artery generally becomes impervious, by the spine of lance or four fingers' breadth, at the place where the ligature is applied; below which part it tube is applied, and continues so far more distally, when the obliteration again commences, and descends along a considerable extent of the posterior artery to the origin of the inferior iliac, or iliac arteries. Thus, says this author, an isolated portion of the femoral artery presents its cavity, from each extremity of which considerable communicating branches arise; the upper branch is carried along into the vessel, and the lower towards it, and communicating branches, that originate below the knee.—(*On Diseases of Arteries, &c. p. 476.*) Now, as Mr. Hodgkin is unacquainted with any more, except that recorded by Sir Astley Cooper, where, after the vessel was cut, the artery was collapsed from the point of division at the knee to the part in which the ligature was applied, he thinks it probable that, in some instances, a more natural situation exists in the artery, after this method of cure.

In consequence of the system of the blood being more or less impeded in the sympathetic way by the application of the ligature in the femoral artery, the aneurismal cavity soon becomes completely filled with coagula, which even block up the venous portion of the aneurism. The coagulated blood in the sac is afterwards absorbed; and a partial destruction and final disappearance of the aneurism of the new mode; with the exception of a slight induration, which sometimes

remains, composed of a remnant of the sac itself, or of the fibrous part of the vessel. These slight indurations in the cavity of the limb, sometimes are imperceptible, and does not hinder the patient from performing the manœuvre of the knee and leg with quickness and safety.—(*Cooper, p. 255, vol. 2.*)

After the operation, the circulation is carried on principally by the anastomosing vessels, which branches communicate with the articular arteries of the popliteal, and with arteries sent to the knee by the anterior and posterior tibial. Large branches in the sciatic nerve, sent off by the aneurism profunda, communicate very freely with the popliteal artery, the anterior, and branches of the posterior tibial. As Sir Astley Cooper has further explained, the freedom of anastomosis between these is a description of an aneurism. The femoral artery was tied by Mr. Key, and the patient, after being disengaged, returned with a painful tumour in the knee, attended with excessive tenderness. The limb was swelled, and a large artery, passing to the tumour, and inserted nearly in the usual place of the normal, forming a ligature.—(*Lectures, &c. vol. 2, p. 161.*)

When the advantages of the foregoing method of operating are contrasted with the dangers and so many of the practice of laying open the aneurismal tumour, and applying ligatures round the distal part of the vessel, it is surprising to find any living surgeon still exposing a patient to the latter mode of treatment under any circumstances whatsoever. Yet Boyer, Roux, and a few of the modern French surgeons, are in this way of thinking, which reminds me of their slow-witted, at every opportunity, when by the first operation, on the greatest and most decided advances to perfection ever made in the practice of surgery. The severity and difficulties of the old method of operating, in cases of popliteal aneurism, are most fully depicted by Cooper. In the knee, says he, the artery lies very deep. The space is limited and narrow, within which it is brought into view and tied, without risk of lying along with it, or of destroying some of the principal businesses formed by the articular arteries of the knee. In account of the depth of the artery, it is difficult to pass any instrument round it, without touching other parts; and it is no less difficult to trace the ligature on the vessel with a proper degree of lightness. Scarpa then represents the distal part of the artery as the narrowest, divided part of the vessel, which is sometimes so high up, that, in order to apply the ligature above it, it is necessary to cut through the long head of the triceps, and make a passage through into the thigh, or, the distal or lower part of the artery is situated so low down in the calf of the leg, that it is impossible to avoid touching, either in the incision or the ligature, the lower anastomosing articular arteries, or the preservation of which the circulation and life of the subsequent part of the limb is a most delicate affair. We must add to all this the violent convulsions, which are the great venous nerve, which an assistant must hold drawn to one side of the wound, nearly the whole time of the operation. The proceeding is also liable to other great difficulties, as may be seen from a case reported by Malatti (*Ann. and Anecdotes, p. 34*), where the popliteal artery was so firmly tied, and, as it were, confused with the vein, the nerves, the tendons of the neighbouring muscles, and the pulsations, that the cavity of the limb presented the appearance of an interlacement of parts, and every separate body and its order. Lastly, the operation leaves a large deep wound, lay open the whole cavity of the knee, and followed by great suppuration, abscess, and formation of the heads of the bone and joint. If the patient be not terrified into the progress by these difficulties, and even if the parts in the limb heal, he is still always left with an irreparable weakness of the knee, and perpetual lameness. Thus, Malatti (*ib. cit. p. 37*) relates one case, where the subsequent effect related with destruction of the soft parts in the knee, that not a vessel of artery, vein, or sciatic nerve was left, and the patient remained all the rest of his life with a paralytic leg, and a severe and fatal ailment to the knee.—(*Cooper on Aneurism, p. 251.*)

I shall now advert to a few facts in the history of surgery, which evidently led to the bold and successful operations adopted at modern times for the cure of aneurisms of the femoral and popliteal arteries. The earliest case of which the particulars are recorded, amounting to a satisfactory proof that the former extremity might be duly supplied with blood, notwith-

standing the femoral artery had been tied high up in the thigh, is the example related by M. A. Borelman of a false aneurism of the thigh, about right finger's breadth below the groin, caused by a gunshot wound. In this instance, Borelman tied the femoral artery above and below the aneurism in it, and not only was the patient's life saved, but the use of the limb also preserved.

(*Chirurgie Algérienne*, p. 2, *Épistémologie*.) The most authentic case of the ligation of the femoral artery, is that reported by Rivière, where Borelman, in 1698, tied the artery on account of a false aneurism, the wound of a sword-wound, at the lower and upper part of the thigh. The surgeons called into consultation were immediately convinced, that the only thing to be done was to take up the femoral artery; but they were instructed the artery should perish of bleeding ere the opening in the vessel could be bound; and in order the artery were secured, they speedily effected the destruction of the circulation would be followed by mortification of the limb. The patient was therefore first prepared for his fate by the administration of the narcotic. A band was then applied round the upper part of the thigh, and infected by means of a stick with which it was twisted, a piece of quassia being put under the hand, in order to render the constriction less painful. The incision was then opened, the clotted blood extracted, and the opening in the artery detected by introducing the finger. A curved needle, armed with a double ligature, was then introduced under the femoral artery, and one of the ends was tied above, and the other below the wound in the vessel. Then follows a curious passage, showing the surgeon's judgment at that time, respecting the propriety of interposing any cylinder of linen between the knee of the ligature and the artery, in case of the old surgeons at that time used to do, as well as a few of the moderns. "*On ne put point de mettre entre eux un tige de linge, ni d'écarter le point compressif car le sang de l'artère ne cessait de couler, comme font quelques uns, parce qu'ils jugent qu'il doit d'écarter grande importance de leur traitement sans savoir à cause de cela, et que l'on n'aurait pu le voir de faire un entortement à petit compresse, &c.*" For greater security, assistants who suffered each other in turn kept up constant pressure on the tied part of the vessel for twenty-four hours. In six weeks the patient recovered, and afterwards enjoyed such good health that he went through several campaigns. (*Journal, Mémoires, Recueil des observations Clin.* 169, 170, *Chim. Paris* 1702.)

Now, with respect to these two cases, it merits attention, that though Rivière, Morgagni, and others, endeavored to explain the success, by supposing that such of the patients in question must have had two femoral arteries, both Borelman and Rivière were wise enough to avoid making any such erroneous inference themselves. At a later period, Gualtieri has been the femoral artery, as it passed under Poppert's ligament, compressed it against the margin of the pulley, by means of graduated compresses retained with a wire roller, and thus obtained the speedy obliteration of the vessel, and cured the aneurism, which had been first spontaneously opened. (*De Extremis Arterio-vascularibus*, 1715, 1716.) In the same book is given the case of an internal aneurism, which, when it had continued three months, and become equal in size to a large pea, was attacked with gangrene, whereby the aneurism was quickly destroyed, and the femoral artery was obliterated for a considerable extent from the point such denervation. The aneurism nevertheless left, however, and the ulcer had a great inward leak, when the patient fell a victim to debility. (*Ibid.* 17.) Here it is to be remarked, that during the five weeks this man lived after the obliteration of the femoral artery above the origin of the profunda, not only the circulation and life of the whole limb were preserved, but the auxiliary arteries, issuing from within the pelvis, proved capable of sustaining the progress of the nutrition of the parts past the aneurism, and of counteracting the heaving process as a disease which caused great signs of a cure. A similar fact is also recorded by Dr. Clarke. (*Medical and Comment.* vol. 2.)

In cases of aneurism in the thigh, it is not always practicable to decide with absolute certainty whether the disease is situated in the femoral artery, or in the profunda; and even when it is apparently contiguous with the former, the latter is often deeply involved, particularly when the disease has been of long standing.

Many unsuccessful cases have been reported; and I know of one which has failed in the hands of a skilful and skilful surgeon, the aneurismal tumor still remaining, although the femoral artery was tied above the aneurism. In this case the disease is no doubt seated in the profunda.

Many surgical writers and teachers have insisted on the doctrine, that when the aneurism is situated in the thigh, the ligature must always be applied to the profunda, lest the circulation of the limb should suffer. A distinguished surgeon of Philadelphia, performed opening the use of a femoral aneurism, and applying his ligature below the profunda, rather than carrying the artery higher up. The operation failed, however, and the patient still perished. That such facts are solely precedents, may be confidently asserted from analogy, furnished us we are with the knowledge that the aneurism, the common iliac, and even the aorta itself, may be obliterated, and yet the aneurismal vessels continue the circulation. But Dr. Wainwright, an accomplished surgeon of Charleston, S.C., has afforded a demonstration in a case of aneurism in the thigh, from a gunshot wound, in which he tied the femoral artery just below Poppert's ligament, and of course above the point at which the profunda goes off. The case has been completely successful, and the patient recovered without any morbid disposition in the circulation, and without any unusual symptoms.

The cases in which the femoral artery divides high up, which Professor Goussier has shown are by no means infrequent, may account for the successful failures of this operation, and should not be lost sight of by the judicious surgeon. As a general rule, however, applicable to all other cases, when the aneurism is situated immediately below the profunda, and in the vicinity of the profunda it is safer, and less laborious, to apply the ligature above. The action of the profunda may counteract the action of the operation, and the most powerful support may sometimes sustain the seat of the disease.—*Revue*.

There are other cases which might be quoted, but I shall simply state the efficacy of the aneurismal operation in the support of the limb, though the femoral artery had been tied, or obliterated in a very high situation.

Besides these facts, surgeons derived every encouragement to attempt the cure of popliteal aneurism, by the ligation of the artery above the cancer, from the elucidations given by Winslow and Hunter concerning the anastomosing communications which exist between the upper and lower articular arteries. Hunter even drew the conclusion, that if the course of the blood were interrupted in the popliteal artery, between the origin of the two orders of articular branches, such aneurism would suffice for carrying on the circulation in the leg. And at length Rivière, weighing the anatomical observations of Winslow and Hunter, and the facts recorded by Borelman and Rivière, first proposed applying to popliteal aneurisms an operation, which, with the exception of these two cases, and until this time been restricted chiefly to aneurisms of the brachial artery. (*Ann. de Chirurgie, Structures Anesthésiques*, 1799, *Chim. Paris* 1799, 1800.)

It was in Italy that the earliest operations were undertaken for the cure of popliteal aneurism, by Graaf, but, or rather by a German surgeon named Keyser, as would appear from a letter written by Tom to Omerig. (*Ann. de Chirurgie, Structures Anesthésiques*, 1799, 1800.) The success obtained by these surgeons soon led others to imitate them, and by degrees, the practice of tying the femoral artery became common both in cases of aneurism and wounds; and from the observations of Winslow (*Med. Disp.* 1799, 1800), Arvid (*Annales de Chirurgie, Structures Anesthésiques*, 1799, 1800), Loder (*Ann. de Chirurgie, Structures Anesthésiques*, 1799, 1800), Borelman (*Ann. de Chirurgie, Structures Anesthésiques*, 1799, 1800), and many others, it was proved beyond the shadow of a doubt, that the circulation might continue in the limb after the obliteration of the femoral artery, whether such obliteration were effected by direct pressure of the ligature.

The exact period when the first operation of tying upon the femoral and tying the profunda artery was performed in England, is not, as far as I know, particularly specified. However, judging from the allusions made on this practice in the writings of Pott

(Remarks on Palsy, &c. See Lond. 1779), of Wilson (Cancer and Aneurism in Surgery, See Lond. 1779), of Kirkland (Thoughts on Aneurism, See Lond. 1780), and of others, it is clear that this method of treatment had been often done in this country earlier than the date of those works, and as would appear with little or no success. The earliest instance of this kind in France was made by Cuyper in 1781 (*Ann. Chir. Chirurg. de M. d. l'opérateur*, t. 1, p. 555), about five-and-twenty years after the examples set by Guastaldi in Italy; but Cuyper failed in his endeavours to press the blood from the exposed cavity of the tumour, and was therefore obliged to amputate the limb. Subsequently to this attempt, the operation was undertaken by Velpeau in two instances, the terminations of which were successful. Consequently, this method may be regarded as entered to the honour of having proved to his contrivance the possibility of entering the popliteal aneurism, by laying open the sacculus, and securing the artery in the limb.

The severity and danger in all instances of this method of operating I have already noticed, and shall repeat the objections to it. With respect to the hæmorrhagic pressure, the great venousness of which were thus the artery in some distance above the tumour, and not opening the swelling at all, Hæmorrhoids were excited that Hunter's artery should be altered in its position, which he conceived was in reality the intention of Guastaldi. Here we observe, that again pain is a poor claim, and with respect to the latter, because the method of which he speaks only resembled Mr. Hunter's, inasmuch as it was not as directed to be tied at some distance above the swelling, while Guastaldi only tied the artery close above the tumour, and opened the swelling, a serious deviation from the Hunterian practice.

Guastaldi, a disciple of Ambrose Pare, having to treat an aneurism at the bend of the arm, the compression of bandages, exposed the artery above the aneurism, and five vessels then opened the sac, took out the coagulated blood, and dressed the wound, which healed by suppuration. After more than a century, And, as being consulted about a similar case, tied the artery above the swelling, which was left to itself. The patient recovered, the hæmorrhage became smaller, and healed, and left some marks as traces of the disease were perceptible.

In 1785, Desault operated in the same manner for a popliteal aneurism: the swelling diminished by manual and the bloodings raised; on the fifth day it burst, coagulated blood and pus were discharged in large quantities, and the wound, after continuing a long time fistulous, at length healed. Towards the end of the same year, says Faguet, Desault applied the ligature somewhat differently: instead of placing it close to the swelling, or directly above it, he put it on the inferior part of the femoral artery. (*See Nouveau Chir.* t. 4, p. 98, 99, 101, 5.)

Unquestionably, And did, in one solitary instance, tie the femoral artery immediately above an aneurism at the bend of the arm, and effected a cure without opening the swelling (*Journal de la Nouvelle Méthode de guérir les fistules indurées*, p. 231, Paris, 1710); but he did not think of applying the plan in the femoral artery, or draw the attention of French surgeons collectively to the matter, to make them imitate this operation: on the contrary, the method fell into disuse, and was never repeated. With regard to Desault's operation, said to have been done in an earlier part of 1785 than Mr. Hunter's first operation, it is only necessary to say, that Desault tied the popliteal artery itself, while the grand object in Mr. Hunter's method was to take up the femoral artery, at a distance from the disease, and that it is thus last mode alone which has gained such approbation, and been attended with successful success.

The French surgeons have not practised the Hunterian operation with the same degree of success with which it is now performed in England, and consequently they very commonly pursue the old method of entering the sac, &c. Even Boyer avers the insufficiency of what he calls Hunter's plan. (*Thèse de M. d. l'opérateur*, t. 9, p. 185.) But we shall not be surprised at their ill success, when we find that they reject the right principles on which ligature ought to be applied to aneurism, as explained by Mr. Jones in his work on hæmorrhage. Even Bland Regault adheres to the

use of ligatures of aneurism; and Boyer applies four iron ligatures round the artery, besides two tight ones; and consequently, a large portion of the vessel lies separated from its natural connection, and limited by these extraneous substances. Hunter's first operation nearly failed also on account of too many ligatures, some of which were tightened so as to cut through the true coats of the artery, and thus process to closure. (*See Hunter's Works*.) With reference to the operation of popliteal aneurism, Rosenkrantz's *Chir. Anat. Placida* deserves to be mentioned, Part 3, Tab. 2, c. 2. Scarpa's and Tiedemann's successful operations, and Haller's losses should likewise be examined.

ANNEALS OF THE LAW, 1809, FOREIGN, AND ELSE.

Books were not long ago entertained respecting the possibility of curing an aneurism at the upper part of the calf of the leg by tying the femoral artery in the middle of the thigh. (*Archives de Med. Sciences de Arts*, vol. 1, part 2, p. 363.) The author here referred to was led by this uncertainty to have recourse to one operation on the above method of laying open the tumour, in order to get at the vessel lower down. On this case, Scarpa makes some correct reflections: the apostolic judge has answered himself, that, in compressing the femoral artery at the upper part of the thigh, the femur of the leg of the patient is in contact; and that, when the compression was continued for some time, the swelling partly disappeared, and became softer. It ought to have been evident, therefore, that the aneurism might have been cured by tying the trunk of the femoral artery, as described in the foregoing section. In Scarpa's work is a case in which an aneurism in the bifurcation of the popliteal artery was cured by the ligature of the femoral artery. (*See p. 364, c. 3*.) Mr. Hodgson has seen three aneurisms situated at the commencement of the total aneurism, named by the same operation. (*On Aneurism of Arteries*, &c. p. 371.) But, as Scarpa remarks, though the Hunterian operation answers in the case of aneurism in the bend of the arm, and at the upper part of the calf of the leg, it is not so successful for aneurisms situated on the back or palm of the hand, or the dorsum or sole of the foot. The free communication which the ulnar and radial arteries keep up with each other in the hand, and the iliac arteries have in the foot, prevent the operation from succeeding whether the tracheal or femoral artery, or one of the two large arteries of the forearm or leg, be tied. In proof of this statement, Scarpa cites two cases of aneurism seen by himself; one at the instep, the other in the sole of the foot; and a third case of the same disease in the latter situation; all of which were found to be intrinsically the progress of the arteriovascular aneurism. (*P. 361*.) He thinks, however, that the operation of tying this vessel where it passes over the dorsum of the foot might succeed, if aided by compression, applied with a strap to stop the vessels through the other main channel; and he seems to approve of this practice, because the plan of tying the artery above and below the disease (which is the most certain mode of cure) could not be done, without extensive lacerations in the sole of the foot. In an aneurism at the lower part of the leg, Mr. Hodgson judiciously cautions against the practice of tying the artery, as best as possible in the tumour, because the constant circulation through the large interstices in the foot might with ease be swelling to aneurism, in consequence of the blood being driven out from the lower extremity of the vessel, forcing through the anastomosing artery branches, and so forth, the artery between the aneurism and the ligature. (*P. 363*.) Having in one case of aneurism of the arteriovascular artery, Mr. H. Clane applied a ligature just above the tumour without success, and Sir Astley Cooper expressly recommends making an incision in the skin, and applying a ligature both above and below the swelling. (*Lectures*, &c. vol. 2, p. 12.) When aneurism arises from the radial, ulnar, or interosseous arteries near the elbow, tying the tracheal vessel suffices; but if the disease be lower down, the vessel from which a prolepsis must be taken up over the swelling. (*Med. Ann.* p. 203.) A case, strikingly illustrative of this truth is recorded by Mr. Lawson. J. M. P., aged 19, applied to him on the 20th of July, on account of an aneurism at the left radial artery, about the middle of the forearm, discovered by a wound. The tumour was as large as a walnut, and so compressible, that it could

ality in placing the ligature above from the middle, not being sufficiently positive; but the further operations of the knot Mr. Addison very properly recommended the ligature to be put round the artery by means of an instrument resembling a catheter, the wire of which has a little size at its extremity, and can be pushed on and over beyond the end of the tube.

The patient went on tolerably well for some time after the operation; the pulse never exceeded 120, and after a few weeks to 90 or 80. He became exhausted, however, partly by the discharge, and partly by hæmorrhage, and died on the 21st of May, about fourteen days after the operation. It was discovered, on the day of the interment, in the situation of the aneurism, was completely filled with coagulated blood. "The ligature, on moving a part of this (though with a sponge, readily detached it, and without doubt had been disengaged for some days." The internal division, which appeared to have been tied, had separated about an inch and a half from the bifurcation with the external tie. By "supra" I conclude Mr. Addison means, that the upper part of the aneurism had been separated from the continuation of the artery vessel—(See *Medical and Phys. Journ.* vol. 25, p. 207, &c.) Although this gentleman has not given a very clear account of some part of his dissection, and he has also omitted to describe the place of his external incision, or the extent, parts which he divided in the operation, yet I think that all the circumstances of the case taken together leave not the slightest doubt of the external tie artery having been actually tied. The complete dissection of the pulsation as seen as the ligature was applied, and the testimony of several respectable anatomists will seem to prove, being indeed in general, as expected. The pulsation is seen referred to Mr. Addison for this important communication, which was in some degree repeated, it is true by Mr. Addison's master, but as it is well known that some distinguished mathematicians and surgeons in that university formerly expressed very strong doubts of the gradual nature of the operation.

The internal tie artery is also said to have been tied with success by an army surgeon in Russia, upon whom the late Emperor Alexander settled a pension as a reward for the skill displayed in the treatment of the case.—(See *British Medical Review*, p. 26.)

The external tie has also been tied in this country successfully for the cure of giant aneurism, by Professor White, the lecturer of Berkshire Med. Institution. This case is published in the second number of the *American Journal of Medical Sciences*, and is also referred to in Johnson's *Medical-Chirurgical Review* for April, 1828. It is the fourth instance in which it has been ever attempted; and three out of the four have been successful. The only time it was ever performed in Great Britain is the only instance of an Aneurism—*Notus*.

In a modern medicine are given a few particulars of a case, which was supposed to be an aneurism of the gastric artery, and cured by tying it precisely, a high vegetable diet, gentle laxatives, and digitalis.—(See *Trans. of the Philosoph. Soc. of the King's and Queen's College of Physicians in Ireland*, vol. 3, p. 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Stanford has recorded an instance of an aneurism of the internal tie artery itself.—(See *Philosoph. Journ.* vol. 10, p. 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

The operation has been been tied in any case of aneurism of the external or internal tie; but Professor Cline has continued to use a ligature round it as an example of general success. "The patient died fifteen days after the operation, and then died from peritonitis, and from absorption of the artery. The aneurism in the ligature of aneurism tie was re-established about the second day after the artery was tied."—(See *American Med. Repository*, vol. 2, p. 165; and *Crichton's Treatise of Surgery*, vol. 2, p. 115, Philadelphia, 1825.)

(As an act of justice to my distinguished friend Professor Hall, I have been a detailed account of this successful operation, which Dr. Cline admits to have never before been performed. It is also honorable to him, as the profession, and to the country. It is introduced
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cases, as communicated to me by the doctor at my side.

A detailed account of the first operation ever performed upon the external tie aneurism for the cure of aneurism, and especially of the first attempt to apply the ligature to so great a vessel, without dividing the peritoneum, may prove interesting to the profession generally, and must be immediately attributable to practitioners of surgery.

"On the 11th of March, 1827, I was requested to visit a patient with Dr. Osborn (of Westfield, New-Jersey, about twenty-two miles distant from New-York), whom Dr. Osborn, attending under a large number of the right external tie aneurism.

Israel Criss, aged thirty-three years, by occupation a farmer of Westfield and regular laborer, having generally enjoyed excellent health, says, about his middle of January he felt some pain about the lower part of the belly, which he attributed to a full stomach during the winter. He is, in some kind of more great efforts in lifting heavy logs of wood, as his employment at this season consists in carrying wood to market. He, however, was not until a fortnight since that he perceived any tumor about the lower part of the abdomen. Upon examination, the abdomen on the right side was considerably enlarged from about the crural arch, as high as the umbilicus. When the hand was applied to the parietal of the abdomen, a pulsation was felt and retained visible to some extent. To the touch the tumor was violently, and appeared to contain only fluid blood. It extended a little above Poupart's ligament, and reached halfway to the knee, from without near the navel, towards the middle of the side, upwards and backwards along up all the curvature of the stern, and reaching beyond the posterior axillary process of that bone.

The rapid increase of this abdominal tumor occasioned, as the consequence of our patient indicated, the most extreme agony. The sufferings of Criss were so great that his screams could be heard at a distance from the house. He had been bed several times, taken light food, and was kept constantly under the effect of opium. He was now informed of the serious nature of his case, and that without an operation very little chance of his life remained; with great composure he immediately consented to whatever would give him the best prospect of saving his life.

From the nature and situation of the tumor he was apprised of the uncertain nature of the operation, as well as the difficulty of performing it, and indeed that it would require an artery to be tied, which never had been before operated upon for aneurism. With these facts of the situation he cheerfully submitted to be placed upon a table of suitable height, in a room which was well lighted.

Then, in the presence of Dr. Osborn, Dr. Liddle, and Dr. Chase, the following operation was performed:—

The patient and groin of the right side being shaved, an incision was commenced just above the external abdominal ring, and carried in a semicircular direction half an inch above Poupart's ligament, until it terminated a little beyond the anterior axillary process of the ilium, making it in extent about five inches. The integuments and superficial fascia were now divided, which exposed the integuments part of the external oblique muscle; upon cutting which in the middle course of the patient, the muscular fibres of the internal oblique were exposed, the fibres of which were cautiously raised with the forceps and cut from the upper edge of Poupart's ligament. This exposed the spermatic cord, the cellular covering of which was now raised with the forceps, and divided to an extent sufficient to admit the long-thigh of the left hand to pass upon the cord into the internal abdominal ring. The finger moving now as a director, enabled me to divide the internal oblique and transverse muscles in the middle of the internal division, while it exposed the peritoneum. In the division of the first-mentioned muscle upwards, the incision of artery was cut through, and it yielded for a few minutes a smart bleeding. Thus, with a smaller artery upon the surface of the internal oblique muscle between the veins, and one in the integuments were all that required ligature.

With the internal beating of Poupart's aneurism, I now attempted to raise the peritoneum from it, which we found difficult and dangerous, as it was adherent to it in every direction. By degrees we separated it with

Professor Hulse has lately died the victim of one in a child less than two months old but a suppurated aneurism of one of the ilia. She recovered from the operation, but perished a few weeks afterwards from absorption of the aneurism.—*Ibid.*

ANEURISM OF THE BRACHIAL ARTERY.

Surgical writers mention many instances of aneurism at the bend of the arm, produced by the pressure of the brachial artery in passing over, or injured by a blow violent inflicted at the bend of the arm, or at the inner side of the humerus, or on the axilla. Such cases must indubitably be formed by effusion. Although Morgagni and others have stated, that, done with attention, aneurism caused by a wound of the brachial artery, the diameter of the vessel is sometimes unusually enlarged through its whole length above the seat of the lesion, this enlargement, which is very rare, might have occurred naturally before the rupture occurred. Even were it so, it would not explain the formation of the aneurism, and at the bend of the arm, along the inner side of the humerus, or in the axilla, after wounds.—(*Saunders*, p. 168.)

The pressure caused in these cases may certainly be caused by the aneurism of continuity in the two proper parts of the artery, and the consequent effusion of blood into the cellular substance. The effect is the same, whether from an internal ruptured aneurism, capable of absorbing the humerus and the bones of the arm, the blood be effused into the neighbouring cellular sheath surrounding the artery, which it raises after the rupture of an aneurism, or on the wound of the aneurism having closed, the blood be so forced into the artery, and be effused in the surrounding parts. The arterial substance on the outside of the wounded vessel is first injured, as in an aneurism; the blood then distends it, and the vessel is in the form of a tumour, and the cellular substance being destroyed, continues, as at first, a firm capsule of aneurismal sac.—(*Saunders*, p. 171.)

The precontracted or the dilated state of the aneurism, and the regular or irregularity of its formation, depend on the greater or less resistance to the impact of the blood, during the time of its effusion, by the aneurism of the cellular substance surrounding the artery, and by the ligaments flexor and supinator, lying over the sac. The aneurism of the brachial artery being only half as long broad, and situated lower than the common place for bleeding, cannot, at least in such cases, indubitably absorb the cellular substance surrounding the artery, as is commonly supposed.—(*Saunders*, p. 168—171.) This author recovers the greatest resistance for the aneurismal ligaments, which, after having covered the body of the brachial muscle, extends over the whole course of the brachial artery, and is impregnated into the arterial coat. This ligamentous expansion has a triangular shape, the base of which extends from the tendon of the biceps to the internal condyle, while the apex reaches upwards along the inner side of the humerus towards the axilla, in the course of the artery. The brachial artery and median nerve, kept in their situation by the cellular sheath and the ligamentous expansion, run in the furrow formed between it and the internal margin of the biceps.—(*Saunders*, p. 171.) This author authoritatively explains many aneurisms relative to the different, aneurismal, shape, &c. of brachial aneurisms by this aneurismal ligament. While aneurisms, from an internal cause, are not infrequent in the axilla, thigh, and hand, they are very rare in the brachial artery, though a few such instances are recorded.—(*Saunders*, p. 170. *Fallopia*, *Chirurgia*, lib. 2, p. 4.)

The mode of aneurisming a wound of the brachial artery in attempting to bleed, and the method of trying, in efforts made by pressure are described in the article *Hæmorrhage*.

And was the first who tied the brachial artery for the cure of the aneurism at the bend of the arm, to the name may this Hulse did the honour for the cure of aneurism in the ilia, viz. was one who placed above the aneurism, without making any incision, spot or tear the sac itself.

The operation is performed as follows:—The surgeon, having traced the course of the brachial artery, and felt its pulsations above the aneurism, he may either cut down on the vessel transverfly above the tumour,

or make higher in the long suture between the origins of the superior and inferior collateral arteries. The aneurismal sac is to be divided in the centre of the artery, and also the cellular sheath for the space of about two inches and a half. The surgeon, now introducing his left fore-finger to the bottom of the wound, will feel the distended vessel, and if it is not sufficiently bare, he must divide the parts which will cover it, observing to divide the edge of the knife on the side next to the internal margin of the biceps, to avoid dividing any of the numerous structural branches which go off from the opposite side of the artery. He is then to separate with the point of his finger the trunk of the vessel, above a line, or, if together with the median nerve and vein, and expose it a little from the bottom of the wound. He is to separate the median nerve and vein far a small space from the artery, and with an eyed needle is to pass a ligature under the latter, and then tie it with a single knot.

In the operation it should always be recollected that the median nerve lies on the inside of the artery, and, therefore, that the instrument used for pulling the ligature under the vessel should be passed from within outwards, by which means the instrument of the nerve may be more easily avoided.—(*Boyer*, *Traité de Médecine Chirurgicale*, &c. t. 5, p. 193.)

The operation is well described by Mr. Hodgson:—“The surgeon divides the integuments along the inner margin of the biceps muscle by an incision two inches and a half in length. The thin fascia which surrounds the arm will then be exposed, and must be carefully divided in the direction of the external wound. The artery lies immediately under the fascia close to the margin of the biceps. The median nerve is situated on the inner side of the artery which lies between its two true courses. The internal cutaneous nerve is also exposed under the fascia in the middle of the arm, and lies on the same side as the median nerve. The cellular membrane which covers these parts is to be divided, with the care of the artery are fully exposed. This part of the operation will be effected with facility, if an assistant compress the artery above the wound, so as to stop the circulation through it, and render it in some degree dead. The point of an aneurismal needle is then to be introduced close to the skin, and brought out on the radial side of the artery, so as to avoid including the median nerve, or the vein which accompany the artery.”—(*On Diseases of the Arteries*, &c. p. 263.)

Whenever, after the above directions, says Saunders, shall have the treatment of a circumscribed aneurism in the bend of the arm well so taught, it is to be noted, follow the method of those who, supposing the tumour to be formed by the dilatation of the artery, used first to divide the integuments over the tumour, incised the sac, and sought for the vessel above and below the aneurism, in order to tie it in two places; and then endeavoured to make the sac absorb itself. The operation is now reduced to the greatest simplicity, viz. tying the artery merely above the tumour.—(*See Saunders*, p. 266, 268.)

When the aneurism is diffuse and accompanied with violent inflammation and swelling of the whole arm, from the excessive dilatation of the vessels effused blood, Saunders recommends the old operation of opening the tumour, and tying the artery at the bottom of the sac above and below the vessel made by the latter. In this method a tourniquet must be applied to the upper part of the arm, near the axilla, or, if the limb be very painful and swollen, it is better to let an assistant compress the artery from above the elbow, against the first rib. The incision having been made into the tumour, and the blood discharged, a probe is to be introduced into the pulsation in the vessel, from below upwards, as far as reach the artery. This, being separated from the parts beneath, and the median nerve, for a small extent, is to have two ligatures tied under it, one of which is to be tied above, the other below, the second in the vessel. Then the tourniquet, or pressure, is to be taken off, and if there be no bleeding, the vessel is to be made to bleed. —(*See Saunders*, p. 268.) With reference to this operation, Boerhaave (*Clar. Anat. Medica*, lib. 9, tab. 11, *Scutula* plures, *Tendons* &c.) has said, in his description of the arteries, and Campbell (*Præceptor. Anat. Patol.* lib. 1. art. 100) commenting.

It was on the brachial artery, that Mr. Lander

(Med. Obs. and Inquiries, vol. 3) details the experiment of closing the pulsation in the vessel by means of the twisted string, under an anæsthetic, and the plan would not, like compression, obstruct the arterial tube, and therefore that the risk of gangrene would be lessened. Now, although in the trial which was made the bleeding was completely stopped, Lambert was mistaken in supposing that the temporary closure of the weakened part of the artery was lessened by the adoption of the twisted string, instead of pressure on the ligature. If ever a small pressure is so easily lost, so as to leave the tube of the vessel pervious, it is under the circumstances pointed out by Mr. Jones.—(See *British Med. J.*) Had Lambert had an opportunity of observing the state of the vessel some 1000 days after the above operation, he would have found its canal unobstructed; and had he known the freedom with which the collected arteries anastomose with the nearest arteries of the limbs, he would have known how to explain, more correctly the re-establishment of the pulse. I need hardly add, that as the false idea of preserving the perviousness of the artery was the only foundation for the treatment, the patient could never be cured, as no affecting equal severity from ligatures to that obtained by the ligature, is even conceivable.

STILLBORN EYESIGHTS.

Aneurisms occasionally take place in the aorta, and make it necessary to tie the subclavian artery. A question here naturally presenting itself is, whether the surgeon should attempt the operation in an early period of the disease, or wait till circumstances are urgent; the aneurism large and far advanced; the arm obstructed and thus perfectly paralysed, from the interference of the rapidly growing vessels; the patient worn out by suffering and loss of rest; and the danger in danger of bursting? In all cases of aneurisms, unquestionably, there is a certain chance of the disease getting well spontaneously; and in military aneurisms, as is seen in St. Bartholomew's Hospital a few years ago, had seriously disappeared of itself, or was cured by the accident when the patient while lying gave off his case, and by the obliteration of the artery, found no improvement after death.

I believe, however, we ought not to suffer our conduct to be too much influenced by the hope of an infrequent cure, and, from the observations which I have made on this subject, it is my decided opinion, that the operation should never be delayed, so as to allow the patient to acquire an insupportable state. The operation is always difficult; but the difficulty is very easily increased, when the swelling has extended far towards the breast, and has become so large as to push the clavicle considerably upwards. The second example in which the subclavian artery has ever been successfully tied I have observed, proved that the aneurism was fully competent to the supply of the limb with blood. The plan, therefore, of delaying the operation long, with the view of allowing the communicating arteries to enlarge, must be as questionable here as in some other cases of aneurisms; and at all events, the same may be safely advanced, that, previously to the operation, the patient should never be allowed to acquire insupportable pain.

That the limb would receive an adequate supply of blood was well proved, even without the performance of the operation, by cases in which the axillary and subclavian arteries had been checked separately by Douville, as, for instance, by the pressure of an aneurism of the arm.—[For an account of such facts, the reader is particularly referred to *Observations Pratiques sur le Raccourci de l'Arterie*, p. 111; *Journal de Médecine de Chirurgie de l'École de Paris*, t. 2, p. 22; *Consult. Paris*, par M. Blandin de l'École de Paris, p. 218.]

"In this case," says Mr. Hodgson, "the only reason why success which was observed during the operation was due to the deficiency of the pulse at the time the patient was tied, and not to the fact of the vessel being tied." The axillary artery (the subclavian) was obliterated a few days after it had given off any branches."—(P. 67.)

This case was tried by Mr. Hall, at Chelsea, when it had been wounded with a syringe, and an aneurism formed; the arm was preserved, though it remained somewhat swollen, which might be owing to the division of anastomosing vessels. (*Med. Hall on Wounds*, p. 19, vol. 1, and *Scrup.*, p. 277.) Mr. White, at Man-

chester, relates another instance of this vessel being tied, in the case of a wound, but mentions of the limb and limb followed. Three of the nerves were tied and included in the ligature.—(*Lancet*, Med. Journ. v. 1, 1840, p. 100.) In cases of wounds of the axillary, or any other large arteries of the extremities, the surgeon, before proceeding to apply a ligature, should first ascertain the precise point of the wound in the artery; and for this purpose, it may sometimes be proper to cut the middle of the shoulder, to make an incision in the muscle so as to expose the injured part of the vessel; or, if circumstances do not forbid, the external wound may be dilated, until the exact part where the artery has been wounded is discovered. In proof of the propriety of acting in this manner, and applying a ligature above and below the wound in the vessel, Scarpa gives a case, in which such practice was successful in a patient under M. Maunoir, of Geneva: the artery had been injured with a sabre near the head of the humerus; but after the wounded part of the vessel had been traced, and secured in the way above suggested, the patient, a boy thirteen years of age, was cured from the dangers of hæmorrhage, and restored the use of his arm, so that as this was possible, with the loss of the first phalanges of the last three fingers from gangrene.—(See *Scrup.* on Aneurism, p. 412, v. 2, and *Journ. de M. d. 2, 3, 4, 5, 1817.*)

There are two modes of operating for axillary aneurisms, viz. by cutting below the clavicle, in order to take up the axillary artery itself; the other, by making the wound above the bone, for the purpose of securing the subclavian artery at the point where it emerges from behind the anterior scalene muscle.

The first of these methods has been attempted by Douville, Pottier, the late Mr. Keen, Mr. Chandler, &c. It was in a case of wound of the axillary artery that Douville operated. An aneurism, six weeks long, was made below the external third of the clavicle; two thoracic arteries cut were transversed; and the two lower thirds of the great pectoral muscle were cut dividing with a temporary groove on a director; a large quantity of coagulated blood was now discharged; and the artery was directly taken hold of, and tied together with the brachial plexus of the nerve. The arm remained, and the patient died. This case, we must agree with Scarpa, was not a fair trial of the operation, inasmuch as the inclusion of the plexus of nerves in the ligature was an improper measure, and must have produced the occurrence of aneurism. It seems also probably, from the account, that the vein was likewise tied; another serious and important proceeding. Besides, it is worthy of notice, that the case was a wound of the axillary artery, attended with a copious effusion of blood in the cellular membrane in the muscles of this kind, gangrene is necessarily induced, than when the case is a more circumscribed aneurismal tumour.—(See *Chirurg. Clin.*, de Douville, par Fothergill, t. 2, p. 253.) As for Pottier's attempt, it hardly deserves notice, because the operation did not even succeed. His colleague opposed to dividing the pectoral muscle; a rupture, therefore, was made with a needle and ligature; but the artery was not touched, and the operation was not repeated.—(See *Chirurg. Clin.*, t. 2, vol. 1, p. 44.)

In a case of axillary aneurism, which had already burst, and the hæmorrhage from which could only be stopped by pressing the artery against the first rib, Mr. Keen, the surgeon-general, practised the following operation, which was attended with complete success. His plan was to take up the artery above the wound and captured part, in its passage over the first rib. Accordingly he made an incision obliquely downwards, divided the fibres of the pectoral muscle that were in his way, and, when he came to the artery, passed a curved, sharp-pointed silver needle, armed with a seton, under the artery, and tied one of the ends. After a careful examination, finding that the artery passed below the ligature, he determined on passing another ligature higher up, and inserted at the clavicle, he, therefore, passed the needle more deeply, so as evidently to include the artery. In a few days the swelling of the arm began to subside, the wound suppurated, and the ligatures came away with the dressing. The arm afterwards recovered its freedom; and the patient remained in a good humour, the entire removal of the aneurism, &c.—(*The Med. Review and Magazine for 1843*.)

Mr. Keate's operation is shortensided, transverse, as it was a fine guide with a needle, and attended with great danger of wounding and tying parts which should be left unincised.

Mr. R. Chamberlaine, of Huggins, Jamaica, took up the aortic artery below the diaphragm, in a patient who had an aneurism in the left axilla, communicated by a vessel with a cutaneus in the 10th of October, 1818. On the 16th of January, the tumor had considerably increased, but was less compressible than it had been when first seen by Mr. Chamberlaine. The operation was done on the 17th of January, 1819. "A transverse incision, of three inches in length, was made through the skin and pterygoid muscles, along and upon the lower edge of the clavicle, three finger's breadth from the sternal end of that bone, and terminating about an inch from the transverse scapulae. This incision divided a small artery, which was immediately ligated. A second incision, of three inches in length, was also made obliquely through the integuments over the deltoid and pectoral muscles, ending the first nearly in the centre. The pterygoid muscles and all lying between them at the upper part were now removed. The next step consisted in detaching the clavicular portion of the pectoralis major, and taking away the fat and cellular membrane lying over the subclavian vessels. The artery was now brought into view, and its pulsations made it clearly distinguishable from the contiguous veins." After several ineffectual efforts, Mr. Chamberlaine succeeded in passing a ligature under it, by means of an eye-needle, curved for the purpose, and the point of which was brought up with the aid of a pair of forceps. On the 22d of February, the wound was completely healed; the aneurismal tumor reduced to the size of a turkey's egg, and very soft; the arm smaller than before, but its muscular power improving.—(*See Medical-Cur. Trans. vol. 1, p. 226, &c.*) Mr. Chamberlaine expresses his conviction, that the operation would have been much facilitated, had he been furnished with the instrument described in Mr. Harwood's work for passing the ligature under the artery; a still better invention, however, he presents a ligature under a deep artery, in the neck, lately constructed by Mr. Weiss, surgeon's instrument maker, in the Strand. An engraving and description of this portable instrument may be found in the *Med. Mag. and Surgical Journal*, No. 16.

The subclavian artery might be cut at below the clavicle as follows: the surgeon is to begin at incision in the integuments about an inch from the sternal end of the bone. The cut is to run towards the axilla, avoiding a little downwards from a line parallel to that of the clavicle. This wound will bring into view some fibres of the great pectoral muscle originating from the 5th rib-costal bone. These are next to be divided down cellular substance will be found underneath, which is to be carefully raised with a pair of dissecting forceps, and cut. The operator will then arrive at the great subclavian vein, and separate vein arising with it. Under the subclavian vein, and a little further backwards, more under the clavicle, the subclavian artery may be seen and tied.—(*See C. Bell's Operative Surgery, vol. 2, p. 273.*)

On the whole, however, I think, Mr. Harwood's directions for the performance of this operation are the best which have been given. A transverse incision through the integuments, which is to have an obliquity downwards, and to begin about an inch from the sternal end of the clavicle, being continued towards the axilla for the intended three or four or less, as is to end near the axillary margin of the deltoid muscle, without reaching any connection between the deltoid and pectoral tendons, after it would remaining the epigland vein. This incision will expose the fibres of the pectoralis major, which are next to be divided to the dissection and extent of the external vessels. The flap is then to be raised by dividing the lower cellular membrane which connects the pectoral muscle to the pectoral aneurism. The pectoralis minor will also be seen crossing the inferior part of the wound, and, by retracting the flap between the upper edge of the pectoralis major muscle, the surgeon may see the pulsations of the aortic artery. Here one of the several curves lies down, lying in contact with the artery; the other curves lie behind it. In the third arch, the artery was in contact below it; but, on the living, the vein is divided, and above the artery. The cellular membrane transposing these parts into is

separated by careful dissection, or by lacerating it with a sharp aneurism. A ligature having been drawn under the artery with an aneurism-needle, the ends of the cord are to be brought, and a large twisted suture, so as to compress the part over which the ligature. If the artery is incised, the pulsations in the aneurism will immediately cease. This procedure is highly necessary, but one of the cervical nerves should be tied, instead of the artery.—(*See Harwood on Diseases of Arteries, &c. p. 282.*)

When an aneurism extends a certain way towards, or towards the trachea, the incision below the clavicle becomes impracticable, and it is now requisite to make the incision above that bone, and take up the subclavian artery at the point where it comes out from between the vertebrae and lies in the for space of the 6th rib.

In the above subject without any incision under the clavicle, this operation is easy enough; but in a third patient the difficulty is much increased by a large cellular aneurism, for then the clavicle is sometimes as much elevated, and the artery lies so deeply, that a ligature can hardly be carried under it without a puncturing needle by the process. This was the case in an aneurism which I once saw made by Mr. Harwood to tie the artery, and in which one of the cervical nerves suffered by the pulsation of the artery was mistaken for it and tied, so that the aneurism was afterwards burst, and a fatal hemorrhage arose. Hence the advice given by my friend Mr. Hodgson, always to operate in this case while the tumor is small, cannot be too well remembered. A direction given by Mr. Liston is also important, namely, "before tightening the ligature, try the effect of compression with the fingers on the pulsation, so by taking this precaution (says Mr. Liston) I saved myself and my patient the pain of tying the nerve, which got hold of in my first operation, in place of the artery."—(*Journal, No. 152, p. 224.*) The chief difficulty in the operation is that of passing the ligature round the artery, but it may be done either with an aneurism needle which Mr. Harwood has described, and which is exactly similar in principle to Desault's capsule & round, or with the still portable instrument constructed by Weiss. Another very ingenious contrivance by tying deep arteries has also been recently proposed by Dr. Thomas of Geneva.—(*See Edin. Med. and Surgical Review, No. 73.*) The instrument used by Dr. Nott when he took up the artery in aneurism was by presenty noticed.

In order to avoid the inconvenience of the needles ordinarily used for conveying ligatures under deep arteries, Desault (says Knight) invents "true ligature & retractor" composed of a silver tube or sheath, which was brought at one end and bent at the other into semicircular form. The sheath enclosed an elastic wire, the springing extremity of which was accurately fitted to the end of the sheath, and performed with a transverse eye. The instrument was passed under the artery, and as soon as it had reached the other side of the vessel, the sheath was kept fixed, while an assistant pushed the elastic wire, which, rising from the bottom of the wound, penetrated the aperture of the artery in the sheath, and then passed the ligature through this opening. The wire was next drawn back into the sheath again, and the whole instrument brought back beyond the artery, by which means the ligature was conveyed under the vessel.—(*See Quercet's Op. de Desault, par Mead, &c. 2, p. 264.*) Another very ingenious method of passing the ligature under the artery, is that practised by Mr. Key; but as the compression of it is difficult without the plate, I shall here merely refer to that gentleman's description of it.—(*See Med. Chir. Trans. vol. 12, p. 16.*)

The location of the foregoing instruments makes a general direction in the difficulty of taking up the subclavian artery from above the clavicle; but one is to be considered, that without such assistance, the operation should have failed even so as if it were aneurism, as Mr. A. Cooper.—(*See Gen. Med. & Surgery, vol. 2, p. 226.*)

The following example is the 5th in which the attempt to tie the subclavian artery by cutting above the clavicle was ever accomplished.

John Towry, a tinner, aged thirty-two, admitted to extensive dissection, of an aneurism and generally extensive corrosion, was admitted into St. Bartholomew's Hospital on Tuesday, the 25 of November, 1809, as a patient of an aneurism in the right axilla. The

protruded part of the tumour in the neck was about half an inch in diameter, and there was also much enlargement and distension underneath the posterior margin, so that the artery could not be brought near the side of the body.

"The temperature, at both times," says Mr. Harshden, "was 104°, and the pulse in the radial artery of each arm was correspondingly. After the patient had been put to bed, some blood taken from the left arm, and few hours elapsed, his pulse, which on his admission had been 120, became less frequent; his countenance appeared more tranquil; and he experienced some relaxation of the distending sensation in the affected arm; his mind, however, was in great darkness."

The incision of the radial artery of the affected arm, naturally became more extensive, and soon after another wound was made in the cubital artery of the left arm and hand. On the evening of the twelfth day, a dark spot appeared on the centre of the nape, surrounded by inflammation, which terminated in more extensive dissection of the skin. A further incision of the operation being deemed inadvisable, Mr. Harshden performed it the next day in the following manner.

"A transverse incision was made through the skin and platysma myoides, along and upon the upper edge of the clavicle, about two inches and a half in length, beginning at its insertion in the shoulder, and terminating its outer extremity at about half an inch beyond the external edge of the sternocleidomastoid muscle. This incision divided a small superficial artery, which was directly secured. The skin along the clavicle being then pushed up between my own fingers and finger and those of an assistant, I divided it both within outwards and upwards, in the line of the external edge of the sternocleidomastoid muscle to the extent of two inches."

"My object in striking in the skin for the second incision, was to expose at once the superficial veins, and by drawing them carefully from the external vessels, to place myself at my work without wounding them. This provision proved to be useful, for it rendered the flow of blood during the operation very trifling, comparatively with what might otherwise have been expected; and Harroby assisted me with the greatest facility in turning into view those parts which were to direct me in the artery."

"My assistant having now lowered the shoulder, for the purpose of placing the first incision above the clavicle (which I had designedly made along and upon that bone), I continued the incision, with my scalpel, until I had distinctly brought into view the edge of the anterior scalene muscle, immediately below the arch which is formed by the transverse belly of the obohyoides and the edge of the sternocleidomastoid muscle; and having placed my finger on the artery at the point where it presents itself between the scalenæ, I found no difficulty in tracing it, without touching any of the nerves, to the lateral edge of the upper rib, at which point I divided it with my finger nail, for the purpose of applying the ligature."

Here, however, some an embarrassment which (although I was not prepared for it) greatly retarded my expectations. I had intended, from repeatedly performing this operation many years since, on the dead subject, that to pass the ligature under the subclavian artery, with the needle, necessarily need no exertions would be superfluous; I had, therefore, provided myself with instruments of various forms and curvatures to meet the difficulty, each of which most readily conveyed the ligature underneath the artery, but would serve no farther; for being made of solid materials and thus inflexible, they would not allow of their points being brought up again at the very spot requisite, which the extensibility of the space between the rib and the clavicle afforded, and which, in this particular case, was rendered of natural utility by the previous distention of the vessels by the tumour."

After trying various means to overcome this difficulty, a probe of double round steel at length enabled me, which I passed under the artery, and bringing up its point with a pair of small forceps, I succeeded in passing on the ligature, and then tied the subclavian artery at the part where I had previously detached it for that purpose. The opening of the knee was attended with pain; the wound was closed by the dry matter, and the patient was then returned to his bed."

—See *Practical Observations on the Stomach*, &c., &c.

which are added four hours of operations for aneurism, p. 278, &c.]

"It only seems necessary for me to add, that immediately after the operation the passages of the swelling ceased; that the arm of the same side continued to be freely supplied with blood, and was even rather warmer than the opposite arm; that the operation, which was severe from the length of time it took up, was after a time followed by considerable indolence; that the patient died about five days after its performance; that after the artery had been tied, the activity of the arm and the aneurismal tumour partly subsided; and that, on examination after death, nothing but the vessel was found enlarged in the ligature."

In this particular case, descriptions of the tumour, which will be of great service to my fellow-practitioner of this operation. The description is a remarkable one, and which I have already endeavoured to give an analysis of. It is worthy of this instrument, I conceive, that the great utility of the operation will in future be proved. Had Mr. Harshden had his assistance, his patient would have been detained a very little time in the operating theatre, and the extent of the case might have been completely successful. Having witnessed all the circumstances of this case, the interest that I drew from them was, that if the operation could have been made in a moderate time, which now seems practically out of the aid of the surgical resource, the contrast will be by Mr. Wilson, the value is all probability would have ended well. The preceding case is particularly instructive, as being the first instance in which the subclavian artery was successfully tied, without any sudden thrust of a needle, and without the assistance of any part besides the artery in the ligature. It furnished encouragement to repeat the experiment; and all the hope, that activity assistance might be used as well as manual ones, and considered the impossibility of the aneurismal arteries to restrain the whole upper extremity, when the subclavian is tied where it emerges from behind the anterior scalene muscle."

In the year 1811, the subclavian artery was tied in the London Hospital, in a case of aneurism, by Sir W. Blizard, who found no difficulty in going the ligature under the artery, with a common aneurismal needle. A stable ligature was applied. At first hopes of recovery were entertained; but the patient, who was old and debilitated, afterwards sunk and died in the fourth day. —See *Blizard's Reports*, p. 373.

In the year 1815, Mr. Thomas Harroby tied the subclavian artery in the same hospital. The case was as singular in the left axilla, and like all the other examples of this kind upon record, was attended with great pain in the tumour and limb. There was no pulse in the left radial artery, though there was scarcely any difference in the temperature of both arms. An incision about three inches in length was made through the integuments at the end of the neck in the second rib, and parallel with the external jugular vein. The platysma myoides being divided, the cellular membrane was separated with the finger, and the pulsation of the subclavian artery was felt where the vessel passes over the first rib. The finger being pressed upon this part of the artery, the cellular sheath opening it was carefully opened with the point of a knife. A ligature was then introduced underneath the artery, by means of a common aneurismal needle, with the greatest facility. As soon as the ligature was tied, the pulsation in the tumour ceased. On the second day after the operation the left arm began to move more freely, and was as warm as the right. However, difficulty of breathing, twitches, delirium, &c. afterwards ensued, and the patient died on the evening of the eighth day, previously to which great thirst and multiple fingers started up. On opening the body, the practitioners exhibited the effects of a high degree of inflammation, and the heart was covered with a deposit of lymph, its posterior surface being of a deep red colour. The most remarkable of the aneurismal work was of a bright scarlet line, which clung, and was covered with white patches. A ribbon of yellow was also noticed in the lining of the right ventricle, left auricle, and even the whole of the system. The boundaries of the aneurismal tumour were in a state of consolidation. These are all the circumstances which I must here to notice, but more particularly may be perused in Mr. Hodgson's work, p. 602.

It is remarkable that in the cases operated upon in the Guy's Hospital, and some others on record, no difficulty was experienced in passing the ligature near the artery with a common aneurismal needle; a circumstance which might have depended upon the space between the glands and the first rib having been less deep in these instances than the two which fell under our own observation, or it may be which occurred in the practice of Dr. Colles, the Astley Cooper, and Mr. Liston. (See *Lancet*, *Med. Review*, vol. 2, p. 267; *Brit. Med. Jour.* and *Trans. Journal*, January, 1858, No. 41.) In Mr. Key's case, "the depth of the arsis is what the artery was considered to be; it was possible to pass a ligature under it, about three-quarters of an inch of the clavicular portion of the sternocleidomastoid was divided, which afforded sufficient room, and rendered the operating part of the operation easy; the artery became fully exposed in view, and its arterial venous trunk was secured with firmly under it." (*Med. Chir. Trans.* vol. 33, p. 22.)

In Dr. Colles's first case, the artery was tied before it reached the scalene muscles, as the ligature, which was in the high calcareous artery, extended from the medial angle of the sternocleidomastoid muscle along the clavicle, a little beyond the arch of that bone, and rose nearly two joints above it, in a curved form, the apex of the curve being situated at the inner edge of the diverging muscle. After a tedious dissection, it was found that only a portion of an inch of the artery was visible, and on this portion the ligature was placed. Great difficulty was encountered in passing it round the artery, and the artery was supposed to have been tightly wounded. Before touching the ligature the breathing became suspended, and the patient complained of oppression about the heart. These symptoms, indeed, were so violent, that it was judged prudent not immediately to tighten the ligature. On the fourth day, however, the artery was contracted, when the pulse at the wrist ceased, the patient not seeming to suffer much from what had been done. The patient then went on pretty well till the sixth day, when he was seized with a series of shivering and pain about his loins, and, becoming restless, died the hour after the beginning of this attack. On dissecting the artery was found divided, and the disease extended into the subclavian artery.

In another instance, Dr. Colles tied this vessel at the point where it emerges from between the scalene muscles, without any particular difficulty. The operation, however, was soon followed by a train of severe symptoms, delirium, and mortification, and the patient died on the fifth day. (See *Educ. Med. and Surg. Jour.* January, 1855.)

The first case in which complete success attended the operation of tying the subclavian artery, where it first comes below the sternocleidomastoid muscle, was that under the care of Dr. Post, of New-York. The patient was a gentleman, with no morbidities in the left arsis. Dr. Post performed the operation on the 8th of September, 1857, in the following manner. "An incision, commencing at the outer edge of the tendon of the trapezius muscle, was carried through the integuments about three inches in length, at a distance of about a line from a parallel line with the clavicle. This divided the external jugular vein, the bleeding from which required a ligature for its suppression; and in proceeding with the operation, three or four arterial branches were cut, which it was not necessary to secure. The subclavian artery was then sought immediately on the outside of the scalene trachealis and was found to be bare. Passing over the artery at this place, in contact with it, were three considerable branches of nerves, running downwards towards the chest from the plexus above. These were separated, and a ligature passed lightly over the artery with great facility by the instrument well adapted to this purpose invented by Drs. Parry, Harrison, and Hewson, of Philadelphia. On lifting the ligature, all pulsation ceased in the arm. It was observed, the temperature of the limb was increased to its former degree, that the arm was warm. On the 12th of September, the external carotid artery, and about three inches of the subclavian trunk were exposed. On the 15th, the trachea, after being tied to the subclavian artery. On the 17th, the second rib was removed, and on the 18th of the same month, the patient expired no farther advanced, his only complaint being now a little swell-

ing pain in the fingers, and a superficial abscess at the point where the ligature passed. (*Med. Chir. Trans.* vol. 3, p. 155, 60.)

Mr. Liston, of Edinburgh, has the honour of being the surgeon that first succeeded, in Europe, in tying the subclavian artery, by taking up the subclavian artery from above the clavicle, on the 30th of April, 1840. The particulars of the case are very interesting. They prove the risk there always is of tying one of the arterial vessels instead of the artery, unless great caution be employed; and, in fact, Mr. Liston himself first passed his ligature under a nerve, and would have tied it, had he not wisely tried to tie after passing the divided part round, have used the assistance of the finger. As the subclavian artery, instead of being at the point where it emerged from behind the superior scapula, Mr. Liston judiciously divided the muscle to reach its trunk, so as not to expose the phrenic nerve. Mr. Liston, with the aid of an aneurismal needle, he passed a strong needle with ligature under the artery, and having tied it, the lig. with 4 small knots withdrew the needle. In consequence of the great depth of the artery, the knot could not be made with the fingers; but with the assistance of a knot of bowline, each extremity of which had a little notch in it, the ligature was accomplished. (See *Educ. Med. and Surg. Jour.* No. 64.)

Several other successful operations of this kind have independently been done by Kistner, Simpson. One by Dr. Colles, in the General Naval Hospital of St. Peterburgh (see *Med. Chir. Trans.* vol. 32, p. 231); another by Mr. Bailey, in the Lyons Dispensary (see *London Med. Repository for Sept. 1857*); a third by Mr. Webster at Edinburgh (see *Educ. Med. and Surg. Jour.* No. 78); a fourth by Mr. Key, in St. John's Hospital (see *Med. Chir. Trans.* vol. 32, p. 1); and a fifth by Mr. B. Cooper, in the same establishment.

Professor Gibson, of the University of Pennsylvania, has made a case of aneurism anastomosing, by the junction of an old location of the aneurism, by tying the subclavian artery. (See *American Journal*, vol. 5, p. 185.) *Key.*

The instructions delivered by Mr. Hodgson for the performance of this operation, are the best with which I am acquainted. When the subclavian artery (says this gentleman) has emerged from behind the inferior scalene muscle, it passes obliquely over the flat surface of the first rib, with which it is in immediate contact. The external nerves are situated above and a little behind the artery; the subclavian vein passes before it, and undermost the clavicle. If the finger be passed down the external margin of the superior scapula muscle, the artery will be found in the angle formed by the origin of that muscle from the first rib. The shoulder being fixed down as much as possible, the skin is to be divided immediately above the clavicle, from the external margin of the clavicular portion of the trapezius muscle, to the margin of the clavicular insertion of the trapezius. No advantage is to be gained by raising the superior attachment of the infra-clavicular vessels. On this point, however, there is some difference of opinion. Mr. Key having found, in his operation, that the division of the clavicular portion of that muscle greatly facilitated the introduction of the ligature under the artery. (See *Med. Chir. Trans.* vol. 32, p. 5 and 61.) The exposed force of the patient's muscles are now to be carefully divided, without wounding the external jugular vein, which lies immediately lower down, near the middle of the incision, and should be detached, and drawn towards the shoulder with a strong hook. The cellular membrane, in the middle of the incision, is then to be cut, or separated with the finger, until the largest artery at the superior edge of the inferior scapula. He passes his finger down the margin of this muscle, until he reaches the part where it curves from the first rib, and in the angle formed by the origin of the muscle from the first rib, he ties the artery. The ligature is made to be carried under the vessel with an aneurismal needle, or that recommended by Hewson. (See *Med. Chir. Trans.* vol. 32, p. 334 and 5.)

Hodgson thinks that the apex and middle of the rib that supports the ligature. An incision, three or four inches long, is to be made at the lower and outer part of the neck, and extended to the clavicle. This first incision, exposed behind the external edge of the sternocleidomastoid muscle, should go through the skin,

eye of one of the above-described needles, and entered the needle into a bundle, he pressed with his index-finger the cellular membrane and plexus carefully downwards, while he turned it from below upwards toward the artery. As the point now appeared on the other side of the vessel, the above-mentioned hook was passed into the eye, and the bundle uncovered from the other end of it, when it was easily drawn out from under the artery, and the ligature left under the vessel.

In this part of the operation, Dr. Mort argues the necessity of being particularly attentive to the ligatures upon the arteries; one is, to convey the ligature round the artery from below upwards, as the only way to prevent injury of the plexus; and the other is, to fix the hook in the eye of the needle, before the bundle is withdrawn from its other end, because, after this has been done, the bundle moves all directions, and it is then difficult to get the hook into the eye.

With respect to the foregoing instrument, I say otherwise, that they are superseded by the needle lately contrived by Mr. Weiss.

Dr. Mort now made a incision, pressed it with the fore-finger down to the artery, and tightened it very gradually, in order not to stop the flow of blood through the vessel at once. A moderate constriction was kept up some seconds, so that the effect of the ligature upon the heart and lungs might be observed; and as the *Arteria communis* was rendered in the functions of these organs, Dr. Mort tightened the ligature, and stopped the current of blood through the vessel. At this instant, the pulsation of the right ventricle and radial arteries ceased. The nose was tightened still more with the above-mentioned ligature, and then a second knot was made. Dr. Mort was greatly pleased at finding his patient's countenance remain perfectly unchanged, and no complaint made of pain in any other part. Immediately after the ligature had been applied, the anastomotic swelling lost one-third of its size, and the carotid point lay left through its whole extent. The divided trachea and bronchi were now brought into their natural position, the wound closed with three sutures and adhesive plaster, and a compress applied. In the operation three small arteries were tied: the first lay under the sternum, and seemed to be a branch of the *Arteria innominata*; the second was a descending branch of the superior thyroidal; and the third a branch of the inferior thyroidal. From two to four ounces of blood were lost, most of which came from an injured small branch of the subclavian. The operation took up about an hour. The curved spatula recommended by Dr. Cohen, were found very useful for holding the carotid and paravertebral space, while, by their uniform pressure, they materially assisted in restraining the effusion of blood from small vessels, and in taking up little rooms, were infinitely more convenient in a deep narrow wound, than the fingers of an assistant.

The day after the operation, the veins of the right forearm and hand had a knotted appearance. When the circulation in them was promoted by pressure, they became supple for some distance above the knotted part, but filled again immediately, the phenomenon returned; a circumstance that seemed to show, that the thrombus in this area, notwithstanding the ligature, while the artery thickens, will meet us with great energy, though no pain could be felt in the radial and radial arteries. On the contrary, the pulse was very plain in the front branch of the *Arteria innominata*, just above the upper angle of the orbit. The left external carotid lost with unusual ease. In a few days, however, the pain became perceptible again at the right arm.

My notes will not allow me to enter into all the details of this interesting case; suffice it to mention, that the patient suffered considerable febrile disturbance at some periods after the operation, and it was necessary twice to have recourse to sanguification. He was also affected with a severe cough. The discharge from the wound was copious and foul. The respiration was equal to the subsequent day. On the twentieth day, the patient was sufficiently recovered to walk in the garden. On the twenty-first day, the finger was strictly closed; the patient could move his right arm with the same freedom as the left, and he was gaining such strength that no further was entertained about the antiseptic result of the operation.

On the twentieth day, hæmorrhage came on from the wound: it was stopped by the introduction of ligatures and the employment of pressure. About twenty-four ounces of blood were lost, whereby the patient was so depressed that the pulse was no longer distinguishable. On the twenty-fourth day, in the evening, he lost four ounces more blood; on account of his weakness and the painful state of his arm, two grains of opium were administered to him. After one or two hours of bleeding, he died on the twenty-sixth day.

When the body was opened, no traces of inflammation or its consequences were found either at the arch of the aorta, the origin of the *Arteria innominata* or the trunk. The veins were now all open longitudinally, and a probe then easily passed through it into the *Arteria innominata*, when the instrument went through the latter vessel into the cavity of the wound. The lower end of the *Arteria innominata* was smooth and soft; but about half an inch from the place where the ligature had cut through the vessel, marks of inflammation were noticed, and a coagulum adhered to the sides of the artery with considerable firmness, so that much had probably undergone, by means of adhesive inflammation, to close the vessel, but had been prevented from completing the salutary process by the destructive inflammation. One portion of the parietum of the *Arteria innominata* was thickened by inflammation, and an anastomotic branch, as large as a crow's quill, sprang from this artery.

The liver was found as corpulent as usually as it was typically, having largely to the trachea, and under the clavicle to the axilla. The trunk of great vessels, viz. the *Arteria innominata*, the subclavian, and the carotid, was destroyed by electricity in the extent of about an inch, and the ends of both the last vessels buried into the wound. At this place the pleura was considerably thickened by a layer of organized lymph.

The outer surface of the wound was covered with a coagulum, and its edges so much thickened, that a probe could hardly be passed into it. The coagulation extended up to the diaphragm into the external and internal cavity. The *Arteria innominata* was perforated as far as the entrance of the diaphragm. The diameter of the trachea and other organs of the right arm was natural. The external mammary artery was enlarged, but not the internal. The diaphragm was torn, and several lymphatic glands under it in the state of suppuration.

Though the result of the operation was unsuccessful, it seems, as Dr. Mort correctly remarks, some interesting points; namely, that tying an artery of such magnitude, and so near the heart, may be done without occasioning any disturbance either in the functions of the brain, the heart, the lungs, or the right arm.

The suppuration, which continually extended itself more and more deeply, is as shown by Dr. Mort as the cause of the patient's death; for, as no bleeding took place for several days after the detachment of the principal features, it is plain that this must have fulfilled its duty, and that the artery had been closed.—(*New York Med. and Surgical Register*, 1815, vol. 1.)

[This new and formidable operation, the practicability of which Dr. Mort has thus demonstrated, and the safety of which is now decided, it may fairly be expected in which it may become necessary, is justly considered one of the most splendid achievements ever accomplished, and is destined to give the author's name immortality; and this, with the successful case of ligature of the *Arteria communis*, confirms upon American surgery unspeakable laurels. As an evidence of the estimation in which this operation is held in Europe, I feel a national pride in inserting the following extract of a letter from that distinguished surgeon, Professor Codon, of Dublin, written to Dr. Mort after his case of ligature on the *Arteria innominata* had reached him:—I think this trifling is the able operator to the most important, since efforts have been made by the criminals to detract from the merit of the operation; and it has been publicly stated that the same operation has been performed in Europe, and even by Dr. Codon himself. That this is not the fact will be shown from the extract which follows, and which I produce without any further comment.]

"I shall not attempt to say how much the profession is indebted to you for this bold and splendid operation. That it did not succeed I regret on your account; that it will however succeed, there cannot be a doubt in

the end of any remaining man. Their feelings during the first twenty-four days after the operation are to be noted. The degree of edema continued to increase and was well marked, while the slight degree of uncertainty as to the lower limb was still in those feelings to the highest intensity. I have never read the account of an operation in which I would rather take from the operation.—*Revue*.

The aneurism of the aorta was also told by Gracil, on the 24th of March, 1882, in the Hospital of the University of Berlin, on account of a vascular aneurism. The aneurism was exposed and treated with the operation in which a ligature was applied by the means of a lateral incision, interrupted by the pharynx, the vessel being first in most about an inch from the anterior of the aorta, and two inches from the heart. As soon as the ligature was tightened, the pulsation of the arteries of the right arm, right neck, and right temporal artery ceased, and the same instant the throbbing of the aneurism stopped, and the heart became fixed. The constriction of the cord produced no disturbance of any function. The patient remained as well for several weeks afterward, and in doubt was experienced of his recovery. However, when the wound was again healed, hemorrhage came on, and though it was suppressed, and began to be again checked, the bleeding occurred, and the patient died on the day-seventh day. Before the ligature of the aneurism was found closed with ligature. Gracil has written a different story to the method in which the operation was done, the daily pulsation of the case, and preparation from it, and placed in the Royal Anatomical Museum at Berlin.—*Ann. Journ. de Chirurgie*, vol. 1, p. 587. In Mr. Wagon's practice of tying the subclavian artery as aneurism of the aorta aneurism itself, we shall presently speak.

CARDIAC ANEURISMS.

There is no part of the body where the diagnosis of aneurism is more liable to mistake than in the neck. Here the disease is particularly apt to be confounded with tumors of another nature. We have already cited in this article examples in which aneurism of the arch of the aorta so resembled those of the cord as to have deceived the surgeon who was consulted. The swelling of the lymphatic glands, or of the cellular substance, which surrounds the carotid artery, the enlargement of the thyroid gland, and especially aneurism, may resemble an aneurism by the pulsations communicated to them by the neighboring artery. On the other hand, aneurism of long standing, which no longer throbs, and the impregnation over which are changes in color and likely to burst, may be more easily mistaken by an incautious practitioner for chronic thrombus, as the neck is remarkably often the seat of such disease.—*Anger, Traité des Maladies Chroniques*, t. 2, p. 155.

Scarpa mentions one unfortunate patient who was killed by a knife being plunged in a cardiac aneurism, on the supposition that the case was an aneurism.

I need scarcely assure, that by opening a cardiac aneurism a surgeon would expose himself to the danger and mortification of seeing the patient die under his hands, as happened in the example cited by Harlan.—*Cyclopædia Anatomica*, lib. 86.

The possibility of tying the carotid artery in cases of aneurism has assuredly without any dangerous effect on the function of the brain, is now completely proved. Petit declared that the advocate Vieillard had an opportunity of the operation of the right carotid, for the case of which he was ordered a very severe diet, and directed to avoid all violent exercise. Three months afterward the patient had evidently diminished, and at last was converted into a small, hard, elastic knot, without any pulsation. The patient having died of apoplexy seven years afterward, the right carotid was found closed up, and separated from its insertion, as far down as the right subclavian artery.—*Ann. des Sciences de Paris*, an. 1783. Harlan observed a woman whose left carotid was impregnated.—*Opuscule Pathol.*, lib. 16, par. 3. An example of the total closure of both carotids in consequence of aneurism, is stated by Bouchard to be recorded by Harlan.—*Effluvia translat.* of Mr. Harlan, vol. 1, p. 303. Harlan, vol. 4, p. 256, et. 5, of his translation, of *Revue de Chirurgie*, mentions a case

in which the carotid artery was wounded in the case of a nervous aneurism. The aneurism was found to have been that had not the surgeon immediately tied the trunk of the vessel. The patient died nearly seven years after. This is probably the earliest instance of aneurism in which a ligature was applied to the carotid artery. Mr. Abernethy's case is perhaps the second, and that in which Mr. Hastings, a naval surgeon, had the carotid artery tied in a case of aneurism, and which was used by the operation, is well known, as having occurred in the year 1792.—*Ann. Med. Chir. Journ.*, vol. 1, p. 25.

Dr. Harlan knew an instance in which one carotid was severely obstructed, and the disease of the other considerably lessened, without any apparent effect on the brain.—*Ann. Journ.*, for the *Interpretation* of Med. and Chir. Knowledge, vol. 1, p. 121. The Army Surgeon has also recorded an example in which total closure was obtained by the pressure of an elastic cord on the artery, and yet during life no pulsation in the pulsation of the trunk and aneurism.—*Ann. Med. Chir. Journ.*, vol. 1, p. 252. A similar case is cited by Petit.—*Opuscule Chir.*, t. 1, p. 15.

Mr. Abernethy was under the necessity of tying the trunk of the carotid in a case of extensive internal wound of the neck, where the internal carotid artery had aneurism of the external carotid was aneurism. The patient at first went on well, but in the night he became delirious and convulsed, and died about three hours after the ligature was applied. This case is noted by some authors, and the influence which I have seen, that the case died from the great quantity of blood which he lost, and the severe reaction due to the parts in the neck, than from any effect on the ligature of the artery on the brain.

In another instance in which the carotid artery was tied, on account of a wound of the external carotid by a musket ball, complicated with fracture of the condyle and coronoid process of the lower jaw, every thing went on favorably until the seventh day after the operation. Next the intellectual faculties on the functions of the organs of sense had been all destroyed. But at that period stupor, vomiting of bile, prostration, a small aneurism, pale, faintness of the face, and loss of strength came on, followed in the evening by a violent paroxysm of fever. On the eighth day three copious hemorrhages took place from the whole surface of the wound, and on the tenth the man died. In this case, however, the affection of the brain, and the other unfavorable symptoms, would be ascribed by nobody to the effects of the ligature on the carotid, but every one would see the cause in the severe and extensive local mischief produced partly by the musket ball, and partly by the work in which the operation was performed, the surgeon having exposed his incision from the parotid gland to within an inch of the epiglottis.—*Ann. Journ. Général de Méd.*, 42, p. 325.

That the carotid may be tied without losing the functions of the brain, and that aneurism of the artery which of being cured by the operation, is now fully proved. The following is the second instance in which I have been present at the operation of tying the carotid trunk on account of a wound.

A soldier of the 4th regiment was wounded in the neck with a part of the bottle of Warrington, and was brought to Epsom. After he had been some time in the hospital, the bleeding, which had stopped, renewed with great violence, both from the wound and the external wound itself; and it was therefore found necessary to tie the carotid artery, which was done by Mr. Collier. The operation was performed by making an incision along the carotid in the sternocleidomastoid muscle, raising the aneurism from the wound, and tying the artery. A c., and looking into the wound the lower thyroid veins, which were in every instance a very large size, so as to be visible in the wound. The wound being separated from the artery was tied. Though the operation was done by candle-light, it was skilfully performed, and without great credit to Mr. Collier. A short time after he was taken to a military work.—*Ann. Chir. Journ.*, vol. 1, p. 371.

Another example in which the carotid artery was tied and the patient cured, in a case where it was wounded within an inch, was performed by Dr. John Brown, surgeon to the county of North Devon.

Ohio Medical Hospital Reports, vol. 3, p. 211, 1871.) In this instance, the internal carotid vein "did not appear, nor was it a sign of the slightest inflammation during dissection."—(P. 212.) A case, very analogous to the foregoing, is recorded by Mr. Hodgson, and the result equally successful. "The patient was affected as thick as the operation; it was not even seen." A gradual improvement of the point of distention marked the gradual subsidence of the tumour, which proved similar to the foregoing. Her next day changed position in the state of the patient's mind after this operation, who remained as she had been previously, taciturnity and depressed.—(P. 212.)

Another instance is mentioned in which the carotid artery was wounded by a gunshot, and the hemorrhage probably stopped by compression. A similar case is related by Van Buren, in his annotations to the work of Bonetus.—(De Puls. Molyneux.) Maria Leroy has likewise related a case, in which the vessel was wounded by a gunshot, and the wound by the instant application of pressure.—(*Mem. de Chir. Mil.* t. 1, p. 207.) However, considering the size of the vessel, and its inveterate extension far below the neck, and usually compressed, some doubts may be entertained, whether the vessel wounded might not rather have been one of its branches.

November 1, 1835, Mr. Astley Cooper operated on Mary Edwards, aged forty-four, who had an aneurism of the right carotid artery; the tumour resulted from the vicinity of the chest to beyond the angle of the jaw, and descended to within two inches and a half from the clavicle.

The swelling had a strong pulsatory motion. The woman complained of a peculiar tenderness of the artery in the same site, of the head, and of such a throbbing in the brain as prevented her from sleeping.

An incision, two inches long, was made at the inner edge of the sternocleidomastoid muscle, from the lower part of the tumour to the clavicle. This would expose the omo-hyoides and sterno-hyoides muscles, which being drawn aside towards the trachea, the jugular vein presented itself in view. The tenderness of this vein produced the only difficulty in the operation, as, under the different states of breathing, the vessel sometimes became tense and distended under the knife, and then suddenly collapsed. Mr. Astley Cooper introduced his finger into the wound to keep the vein out of the way of the knife, and having exposed the carotid artery by another cut, he passed two ligatures under this vessel by means of a curved grooved needle. Care was taken to divide the recurrent nerve on the one hand, and the vagus on the other. The ligatures were then cut about half an inch asunder; but the intervening portion of the artery was left unaltered.

The pulsation of the swelling ceased immediately the vessel was tied, and on the day after the operation, the throbbing in the brain had subsided, while no disturbance of sleep or energy in any part of the body could be ascertained.

The patient was occasionally afflicted with indigestion, but soon the whole went on at first pretty well. On the eighth day, however, a paralysis of the left leg and arm was noticed, attended with a great deal of spasmodic irritation. Nevertheless, the patient could move her arm rather better, but became unable to swallow solid food. Nov. 13th, the pulse of her arm and leg were discovered. The ligatures came away. Nov. 15th, she was in every respect better, the paralysis with less difficulty, and the tumour was smaller, and quite free from pain. On the 18th, she became very ill; the tumour increased in size, and was still more painful. The wound was as large as immediately after the operation, and discharged a copious serum. Great difficulty of swallowing, and a most distressing cough were also experienced. The pulse was everywhere, and the left arm quite very weak. On the 20th, the patient died, the difficulty of swallowing having certainly become still greater, attended with a further increase of the tumour, the skin over which had acquired a brownish-red colour.

On opening the swelling after death, the aneurismal sac was found inflated, and the clot of blood in it less intermixed with a considerable quantity of pus. The inflammation extended on the inside of the sac, along the par vagus, away to the base of the neck. The glottis was almost closed, and the larynx of the trachea

very inflamed and covered with coagulating lymph. The pharynx was so compressed by the tumour, which had been suddenly enlarged by the inflammation, that a bougie of the size of a goose-quill could hardly be introduced into the pharynx. Mr. Astley Cooper concludes with expressing his opinion that these cases of failure may, in future, be avoided by operating before the tumour is of such size as to make pressure on important parts; or, if the swelling should be large, by opening it, and letting out its contents, as soon as inflammation makes out.—(*See Med. Chir. Trans.* vol. 11.)

Incision was under the care of Mr. Cooper, of Salisbury, the making of an opening, about a month after the operation, governed by discharging seven ounces of vital blood and pus; but three weeks afterward, hemorrhage came on from the sac, and the patient was hurried off by repeated loss of blood.—On dissection, an artery capable of sustaining a probe was found to pass into the cavity of the tumour.—(*See Med. Chir. Trans.* vol. 11, part 2.)

In June, 1836, Mr. Astley Cooper operated, at Guy's Hospital, on a man aged 65, who had a carotid aneurism, attended with pain on the side of the head, throbbing in the brain, blindness, cough, slight difficulty of breathing, vertigo, palpitations, &c. The patient got quite well, and retained his occupation as a porter. There was afterward no perceptible pulsation in the facial and temporal arteries of the aneurismal side of the face.

On the opposite side, the temporal artery broken externally large. The patient was at last quite absorbed, though a pulsation existed in it till the beginning of September. Two weeks incidentally remained perfect; his nervous system was unaffected, and the severe pain, which before the operation used to affect the aneurismal side of the head, never returned.

The swelling, at the time of the operation, was about as large as a pullet's egg, and situated on the left side, about the size made by the difference of the osseous crest, just under the angle of the jaw.

Mr. Astley Cooper began the incision opposite the middle of the thyroid cartilage, on the base of the tumour, and extended the wound in width an inch of the clavicle, on the inner side of the sternocleidomastoid muscle. On raising the margin of this incision, the omo-hyoides could be distinctly seen crossing the sheath of the vessel, and the carotid artery itself was also brought into view. The sterno-cleidomastoides was now separated from the omo-hyoides, when the jugular vein was seen. This vessel became so distended in every situation as to cover the artery. When the vein was drawn to one side, the par vagus was exhibited, lying between the vessel and the carotid artery; but a little in the outer side of the artery.—The nerve was easily avoided.

A double ligature was then conveyed under the artery with a bent iron probe. The lower ligature was immediately tied, and the upper one was cut down tight, so soon as about an inch of the artery had been separated from the surrounding parts above the first ligature, so as to allow the second to be tied at that point. A probe and clamp were passed through the vessel below one ligature and above the other.—The artery was then divided. It is a little more than nine weeks the wound was quite healed, and the patient entirely recovered.—(*See Med. Chir. Trans.* vol. 12.)

Another successful instance, in which the carotid was tied for the cure of an aneurism, is related in a reply to which I always have the greatest pleasure in referring.—(*See Hodgson's Treatise on the Aneurism of Arteries*, p. 220.)

Mr. Thompson tied the carotid artery in a woman, who had an aneurism of the carotid in the left neck. The disease had passed the eye out of its socket. Two small ligatures were applied, which operated on the tumour, but and temporary success. No hemorrhage, nor impairment of the function of the brain took place, and the disease in the neck was effectively cured.—(*See Med. Chir. Trans.* vol. 12.)

Another highly interesting case, in which an aneurism of the carotid artery was effectively cured by tying the carotid artery, is recorded by Mr. Barrymore, assistant in Norwich. This gentleman performed the operation on the 5th of November, 1812. The patient was a female, aged 44. The pulsation of the artery was relieved in proportion to the swelling

Generalized. The violent hæmorrhages also continued; but the symptoms were insupportably bad.—(*New Med. Obs.* Trans. vol. 5, p. 111.)

The carotid artery has sometimes been tied, with the view of enabling the surgeon to cut away everything from the neck and side of the face, when, from particular circumstances in the case there was reason to fear a fatal hæmorrhage without that preliminary measure.—(*New Medical and Surgical Cases, as Observed at Clin. Trans.* vol. 7 and 11.)

An interesting case, in which my friend Mr. Vincent tied the carotid trunk for an aneurism, is published in the 10th vol. of the latter work.—(P. 212, &c.) In this example, the internal jugular vein did not appear to be at all in the way during the operation; none of the fibres of the new ligature, however, could not be immediately drawn tight, and were therefore divided. A single ligature was applied; the pulsation in the tumour did not entirely cease, at first, when the artery was tied, but it did so two days afterward; and the swelling was rapidly diminishing. The ligature came away about three weeks after the operation, and there was every hope of a cure; but, between the fourth and fifth week, a considerable swelling occurred between the tumour and the jaw, impeding deglutition, but not the breathing. This swelling was followed by febrile symptoms, increased difficulty of swallowing, an attack of vomiting, and impeded respiration. In the hope of affording relief, an incision was made in the tumour from which a small quantity of pus had collected inward; but it was in vain, for the patient was dying. On dissection, the carotid artery was found perfectly sound as far as the division of the aneurismal sacculi. But above where the ligature had been, the vessel was open and inflamed, and was tied to it. The most remarkable circumstance noticed was protrusion of air, entering by the inner surface of the artery, and other large arteries, and forced out under the heavy aponeurosis. The life of the swelling in the neck depended upon effusion of serum in the cellular membrane.

In order to get at the carotid artery in the author's manner, Mr. Abernethy has recommended making an incision on that side of it which is next the trachea, where no important parts are exposed to injury, and then to pass a finger underneath the vessel. The par vagua must be carefully excluded from the ligature; for to tie it would be fatal.—(*Surgical Observations*, 1804.)

The case of carotid aneurism by the operation has now been so often successful, that even to refer to every case upon record would demand more space than I can afford. A successful instance is related by Macartney (*Edin. Med. Surg. Journ.* April, 1804); another by Dr. Ford, who used two ligatures, and divided the artery in the space between them (*New-England Journ. of Medicine and Surgery*, vol. 3, p. 205, Boston, 1814); another by Mr. Giles Lynde, proving the sufficiency of a single ligature.—(*Med. Clin. Trans.* vol. II, p. 57, &c.) The case in which Mr. Goodall tied the carotid, in order to prevent hæmorrhage in the removal of a fungus involving the parotid gland, is contained in vol. 7, p. 112, &c. of the latter book. The example in which the vessel was tied by Dr. Franks, in the length of Hareburgh, for the cure of a fistulous purpura, is reported in the *Lancet*, N. 192. Some discussion of the swelling, and increased power of swallowing followed; but suppuration took place, and the case ended fatally.

The most anatomical privileges of the parts concerned in the operation of taking up the carotid artery, are those by Tieboutin and Rouviere.—(*Ann. Chir.urg. Journ.* Amsterdam, &c. 1, vol. 7, p. 93.)

For the particulars of a second aneurism caused by the ligature of the artery by H. Wilson, see *Ann. of Chirurgery de l'Europe*, article, par P. J. Vanderlinden, Paris, 1815. Watson, at Leamington, in the year 1811, tied the carotid artery for the cure of an aneurism with complete success. He applied only a single ligature.—(*Annals of the Royal Med. Soc.* vol. 1, p. 52.) In this translation are reported several instances, in which ligatures and other caustic surgical operations applied to the carotid, Dr. Hall, sister of Hæccher, has also operated with success.—(*Ann. Lond. Med. Repository*, vol. 13, p. 95.)

Dr. Beane has lately tied the common carotid artery in an aneurism situated in the sheath, with complete suc-

cess. Professor Pattison, of the University of London, when resident in Baltimore, cured an aneurism opening at the external jugular by tying the neck of the carotid. I witnessed this operation, and saw the successful result.—(*Edin.*)

Of the mode of tying the carotid above the aneurism, when it is situated so low that the ligature cannot be applied below it, I have also spoken. The facts, by which the propriety of this practice has now been completely established, have also been stated; they appear to me to reflect considerable credit on Mr. Wardrop, to whom this method of operating has been removed and extended. The practice of tying the carotid for the cure of aneurism of the artery transmits that to be tied in the existing section.

NEW OPERATION FOR ANEURISM OF THE ARTERIA AORTICA.

It having been established, that aneurisms may be cured by simply inserting the trapezoid of the blood flowing through them, and that, although a temporary may yet continue to flow, for some time, the layers of elasticities lymph will be the way to suggest, and ultimately bring about a complete consolidation of the swelling, it occurred to Mr. Wardrop, that in aneurism of the artery aorta, the progress of the disease might be arrested by tying its two great branches, the carotid and subclavian. Although a certain portion of blood would still continue to pass along the aneurism to those branches of the subclavian in the carotid of the ligature, the ligature being necessarily placed on the subclavian artery after it emerges from beneath the subcutaneous muscles, Mr. Wardrop conceived, that this would yet be the circulation of the blood in the aorta, but that the future progress of the disease would be prevented, and even its permanent obliteration of the aneurismal cavity would be accomplished.—(*On Aneurism*, p. 58.) The knowings of this process, indeed, he thinks, may be useful in the cure of many aneurisms, which have hitherto been considered beyond the reach of art. In an aneurism of the aorta, Mr. Macleod found that system had only completed a cure of the disease on this principle. The carotid artery was plugged up, and the first aneurismal swelling was filled with a roughness, using only a comparatively small channel for the passage of blood into the subclavian artery.—(*See Appendix to Wardrop on Aneurism*.) Mr. Wardrop has seen two cases, and several are on record, which illustrate some important pathological fact, and prove beyond a doubt, that blood can coagulate in an aneurism so it is strengthened the power of the art, and ultimately its efficacy, without the circulation in the vessel being the first instance either suddenly or entirely interrupted.

It was the knowledge of this fact that led Mr. Wardrop to perform the operation, which he has named Nature, in the case alluded to, had already effected a curative process by contracting the circumference of the carotid artery; and when he found that some he would want to stop the enlargement of the aneurism, he determined to place a ligature on the subclavian. In doing this, he conceived that he was strictly following a process which nature herself had commenced.—(*Id.*) The case of Mrs. Denmark, aged 45, mentions that the subclavian artery, and thus avoid an aneurism of the artery aneurism, is highly interesting. The particulars may be read in his own publication, or in *Edin. Journ.* for 1817. Suffice it here to state, that the case was completely cured. In the appendix to Mr. Wardrop's publication, and in the *Lancet* for November, 1818, is another highly interesting case, containing the account of the privileges explained by the foregoing synopsis. It is an aneurism in which Mr. Jones, of Bath, Bathurst, successfully made an incision of the aneurism and cure of the aneurism by tying the latter vessel. In the year, he joined a scholar and householder, thirty years of age, was so much as moved regularly the markets and sold Mr. Dyer, seven years from his house. In the course of the case, three remarkable circumstances occurred. 1st. An obliteration of the large arteries of the right arm. 2dly. A profuse sanguine. 3dly. A rupture to paralysis of the right side, suggested by Mr. Jones as having arisen from a greater quantity of blood, than sent to the left hemisphere of the brain than 18 1/2 right. However, in such aneurism has not aneurism.

other operations in which the vessel was tied, the truth of the explanation seems doubtful. The following account seems entitled.

[It affords me high gratification to record, that Professor Hager, of this city, has lately performed this operation for the first time it has been attempted in America, by tying the arterial artery for the aneurism of the aorta (aneurism, involving the whole vessel, and not of the aneurism). This is the first time in America in which aneurism has been treated by tying the artery on the posterior side of the vessel. The report of the case, and its successful result, is contained in the *American Journal of the Medical Sciences*, No. 10, for February, 1836. Since that report was published the patient has died, and his remains having been recovered, fully establishing the success of the operation. I have had an opportunity of examining the preparation, and found the vessel entirely aneurismal and the patient died the aneurismal sac, although the ligature was applied very high on that vessel. The death was occasioned by the decomposition and distension of the trachea and lungs, which was seen lying on the side of the neck, and as it was connected with the operation, but was the consequence of the long existence of the disease before the operation was attempted. — *Doyle*.]

OF ANEURISM OF THE AORTA, AND TAYLOR'S TREATMENT.

This afflicting and fatal disease is by no means infrequent, and the seat of the aorta is its usual common situation. Dr. Hager was of opinion that the latter circumstance depended on the terrible manner in which the blood, propelled from the left ventricle of the heart, must be driven against the angle of the rigidity of the vessel.

Mr. A. Harris, consistent adherent of the thoracic aorta must depend, perhaps, than that of any other vessel in the body. "I have had (says he) an opportunity of examining patients who had died of this disease, but have not seen more than three instances of external aneurism." — (*The Diseases of the Heart*, &c. p. 753.)

These propositions, however, would not correspond to common observation, external aneurism, taken collectively, being supposed to be about as numerous as those of the aorta alone, a calculation long ago made by Dr. A. Meigs, p. 200.

It was the opinion of Dr. W. Hager that the aneurism was composed of the dilated coats of the artery, which parts nature thickened and studded with ossifications after the origin of the disease, for the purpose of resisting its increase. Mr. Hodgson, also, in his interesting publication declares his decided belief, and advances facts to prove, that many aneurisms of the aorta are formed by dilatation. *Scarpa* argues, however, that the generality of aneurisms of the aorta are the consequence of a rupture of the proper coat of this large vessel, and that the cellular sheath of the artery is what becomes distended (and the thickened and ossified aneurismal sac).

Dr. W. Hager considered the ossifications of the sac as consequences of the disease; but Hager inferred from such ossifications in the aorta as the very cause of the aneurism, by rendering the artery insensible, and incapable of yielding to each pulsation of the heart.

It is unquestionably true that aneurisms of the aorta are most common in persons who are advanced in life, and it is equally well known, that the aorta of every individual, whether affected with aneurism or not, is almost always injured in some place or another with ossifications, or rather with calcareous concretions, dark protuberances appear to contain a dense or aneurismal of the interior and inner coats of the vessel, so that in length the force of the blood makes the artery give way, and the fluid collecting in the course of the aneurism or rupture, gradually distends the external sheath of the artery into the aneurismal sac, which is not a disease in fact of considerable duration, and ended with mild symptoms.

If any person who is not prejudiced in favor of the common doctrine with regard to the nature and progressive course of this disease (says *Scarpa*), will examine, not hastily and superficially, but with care and by dissection, the aortic structure and nature of the aneurism of the aorta, including such points as attend the proper and common coats of this artery, and

in succession those which constitute the aneurismal sac, in order to ascertain distinctly the nature and limits of both, he will clearly see that the aorta, especially speaking, contains nothing in the formation of the aneurismal sac, and that, consequently, the sac is merely the cellular membrane, which is the aneurismal sheath of the artery, or that soft cellular sheath which the artery received in common with the neighbouring parts. This cellular membrane, being raised and compressed by the blood effused from the aneurismal or ruptured artery, assumes the form of a compressed bladder, covered externally, in aneurism with the artery, by a strongly tendinous, such as the pelvis in the aorta, and the peritonium in the abdomen.

Several facts themselves upon the differences of mere dilatation of an artery from aneurism, a subject which has been already fully noticed in the foregoing pages. — (*Scarpa on the Aneurism, Pathology, and Surgical Treatment of Aneurism*, transl. by Winslow, p. 116-120.)

As I have already explained in the preceding chapters, the weakness of this aneurismal aneurism are not adopted by the generality of surgeons; at least, the doctrine is not correct by whom to the extent which he has treated upon, and it would be tedious repetition to bring before the reader again the facts which prove that the statements are false in every respect. A case, however, noted by *Hager*, which I have met with since the foregoing pages were printed, seems to me to be an instance in which a typical aneurism, contracted with pulsation, had been mistaken for an aneurism and punctured, whereby the patient lost his life. On describing the fact, *Hager* says, "the three coats of the artery participated in the distension, and the case was one of the most common species which I have ever seen of a true aneurism." — (*Neurotic Elements of the Heart*, &c. p. 107.)

All arguments brought against the possibility of a dilatation of the outer coat, and founded on the insensible structure of that membrane must likewise be completely refuted by another fact demonstrated by marked preparations, collected by *Debus* and *Requien*, where the outer coat of the aorta is alone distended, protruding through the outer basis in the form of a distinct swelling somewhat like a tumor. — (*Requien*, &c. p. 91.)

In whatever manner aneurisms of the aorta are formed, there are no diseases which are more justly dreaded, or which were completely all the surgeon as well as the patient with despair. No aneurism, indeed, can be more truly dreadful; for the sufferings which are occasioned hardly ever admit even of palliation, and the chances of recovery are so very few, that no consolatory expectation can be indulged of avoiding the fatal end to which the disease invariably brings the miserable sufferer.

The progress of aneurisms of the aorta is scarcely ever known with certainty before they have advanced so far as to be attended with an external pulsation and a tumor that admits of being felt or even seen. In very thin subjects, the throbbing of the abdominal aorta is sometimes transiently plain through the integuments and viscera, and then this occasionally given rise to the suspicion of an aneurism; a circumstance which deserves to be remembered by every surgeon desirous of not presenting a wrong opinion. The peritoneal pulsations, however, which are liable to be mistaken for those of aortic aneurisms, are of various kinds, and form a subject to which the attention of *Dr. Allen*, of Boston, the late Mr. A. Harris, and others, has been very recently directed. — (*See Anderson*.)

While three coats aneurisms of the aorta are compared with no degree of external involution, the symptoms are all external, and might depend on any disease of the heart, ruptured pericardium, pleuritis, pulmonary &c. However, some difference depends upon the volume, position, and nature of the aneurism. As *Laennec* observes, aneurism distends, when in a moderate degree, hardly produces any effect, but the most considerable false aneurisms may give rise to very serious disorders. The first and most common of these effects is, the compression of the heart and lungs. — (*See Laennec on Diseases of the Heart*, by Parker, p. 179, &c. 2.) Very late and irregular throbbings frequently occur between the fourth and fifth true ribs of the 9th ribs; the same irregularity of the pulse prevails in older persons than organic affections of the heart; a gradual jerky of the pulse is the true aneurism; the inspiration

is exceedingly obstructed, the valve closed; and in a brief advanced period of the malady the patient is at times almost suffocated. "The position of the internal trachea on the trachea, bronchi, and lungs, is sufficient to account for this difficulty of breathing. In many instances the irritation and compression produced by the tumour occasion an absorption of the greater part of the lungs, and abscesses and tubercles throughout the portion which remains. Even the function of deglutition suffers interruption in consequence of the pressure made on the œsophagus, which may even be in a state of ulceration. Thus, it is very simple, possibly, perhaps, we find that the cavity of the stomach was nearly obliterated from the pressure of the aneurism; and the accumulation of feces in the colon lay in the œsophagus, having material that could through no other way be cast."—(*Travels for the Improvement of Mind and Character*, vol. 2, p. 53.)

After what has been stated, it cannot be surprising, that when the disease manifests itself externally, affections of the lungs or structure of the œsophagus should often be suspected.—(*Holman*, p. 91.)

"An aneurism of the aorta, unattended, not discovered till after the patient had died of suffocation, gave rise to great difficulty of drawing air into the chest without any other symptoms calculated to throw light on the nature of the disease. The aneurismal swelling was situated behind the first bone of the sternum, and pressed upon the trachea. The first of this rule was pushed in by the tumour so as to prevent a necessary prominence on the inner surface, which, however, diminished in area in a very slight degree. Mr. Lawrence adduces this fact to prove that species of the aneurism may be the cause of great difficulty in breathing. "The termination of this case (says he) is the more remarkable, inasmuch as in another patient an aneurism rising out of the arch of the aorta, and pressing on the corresponding part of the trachea, seems to produce obstruction of the internal trachea, under which there was a slight appearance of congested blood, caused in affection of the length at all. The person died of a different complaint, and the discovery of the aneurismal tumour, which was very small, and filled with fine laminated coagula, was quite accidental."—(*Med. Obs.*, *Travels*, vol. 8, p. 375.)

Thus we find in thoracic aneurisms, at least previously to their attainment of a certain size, that no regularly prevailing signs with regard to difficulty of breathing, the symptom which, a priori, one might suppose would necessarily be present.

New diseases, according to Lawrence, are so immediate manifestations of the thoracic aorta. He affirms, that "it cannot be known with certainty till it shows itself externally. It can hardly be suspected even when it compresses some important organ, and greatly deranges its functions. When it produces neither of these effects, the first indication of its existence is often the death of the individual, as instantaneously as if by a pistol-bullet." One case, recorded by Mr. Pott, confirms the same fact, for the patient had only symptoms leading to a suspicion of enlargement of the neck, and died suddenly of apoplexy."—(*Observations on the Wind and Neck*, &c. by Pott, &c.) Lawrence has known persons die off in this manner who were believed to be in the most perfect health. He admits that persons may sometimes enable us to detect in tumours of large size existing within the mediastinum, or even in the neck; but not to discriminate the nature of the swelling. His experience did not seem sufficient to let him pronounce how far the difficulty of diagnosis was likely to be increased by the aneurism. However, aneurisms of the abdominal aorta he says, are recognised with the utmost facility by means of this intervention. In this case we are sensible of considerable pulsations, which peculiarly affect the ear, and the quantity of which is not at all increased by the hand, even when infinitely sensitive to the touch. As high up as the neck artery the contractions of the arteries never is so well distinguishable. The speed of the pulsations is described as clear and loud."—(*Lectures on the Health of the Chest*, p. 375, &c.)

I have mentioned that the symptoms of thoracic aneurisms, particularly in the formation of an aneurism, are often resemble those of pneumonia, and the latter is sometimes actually supposed to be the disease under which the patient is labouring. But there is

one distinction between the cases, which is pointed out by Mr. Hodgson, and may be of use, in explanation with other circumstances, in limiting the diagnosis. "In pneumonia, the expectoration is either purulent or thick and white; but in aneurism what is coughed up is accompanied with hæmorrhage in the lungs, as far as I have observed, it always consists of a thin frothy mucus."—(*The Diseases of Aneurism*, &c. p. 93.)

According to Hodgson's experience, the cough coming on at irregular periods, is violent, and attended with great efforts, the expectorated matter being raised by the violence. He agrees with the thinkers respecting the genuine quality of what is expectorated, while thoracic aneurisms are not complicated with hæmorrhage; but he says that the matter coughed up also frequently consists of mucus or stringy mucus with fine and purulent blood, which seems, when thrown into water, seem as if they were composed of a lot of stringy substances.—(*Garrison's Treatise of the Aneurism*, &c. p. 125.)

From a review of many cases of aneurism, according to Mr. A. Barnes was inclined to think, that when the ascending aorta is aneurismal, the breathing is more affected than when the arch of the vessel is enlarged, but that in the latter case the impediment to deglutition is greatest.—(*The Diseases of the Heart*, &c. p. 244.)

According to Lawrence, false aneurisms are most common in the descending aorta; and true ones in the ascending portion of the vessel and its arch. He has never met with any species of false aneurism in the latter situation, but such as is homogeneous in the true or simple form of the artery.—(*See Lectures on the Diseases of the Chest*, p. 376, &c. by Pott, &c.)

The way in which aneurisms of the thoracic aorta prove fatal, is subject to considerable variety. These swellings do not always destroy the patient, by hemorrhage; in numerous instances, the magnitude of the disease so impedes respiration, that death seems induced by suffocation, and not a drop of blood is found internally effused. Frequently no less the description of Mr. John Bell, before the death and fatal hemorrhage has had time to occur, the patient persists in suffering so great for nature to beat. The aneurismal manner so fills the chest, so compresses the lungs, compresses the trachea, and curbs the course of the descending blood, that the system with a pain strivings of the expanded blood, is quite exhausted. And thus, though the patient is saved from the most terrible scene of all, he suffers great misery; he experiences in his chest severe pains, which he compares with the stinging of knives; terrible palpitations; an awful sense of sinking within him; a hoarse within his throat, as if of the running of waters; a continual sense of his condition; sudden startings during the night; fearful tremors and dangers of suffocation; and with unceasing night, miserable thoughts by day, and the gradual decline of an exhausted system, he grows weak, frequent, and expires."—(*See Aneurism of the Human Aorta*, by John Bell, vol. 2, edit. 3, p. 224, 225.)

Mr. A. Barnes was two examples, in which the patients died instantaneously, though their aneurismal tumours were very small and had not burst. But these patients were in the early stage of pregnancy.—(*The Diseases of the Heart*, p. 224.)

The situation in which aneurisms of the curvature of the aorta burst, are different in different cases. Sometimes the swelling bursts into the cavity of the chest, or that of the pericardium, and the patient drops suddenly down. According to Lawrence, the severity of the disease is by far the most frequent situation in which the thoracic aneurism of the aorta bursts.—(*The Diseases of the Chest*, p. 377.) When the coats of the aorta give way within the pericardium, where they only receive a slight external meniscus covering, drops up to be thus retained at the same time, so as to bring its exposed surface of blood, which compresses the valves of the heart, and produces immediate death. In other examples, the blood is effused into the cavity of the chest, and the patient, after violent coughing and efforts of blood from the mouth, expires. Sometimes, after the tumour has become closely adherent to the lungs, it bursts into the vessels, through which the blood is readily effused. An example of this termination of the disease was observed by Lawrence; who also saw about six or eight, in which, if the patient had lived a little longer, the same catastrophe is all probably would have happened. Blandin says, that he is not

arch of the aorta may occasion a rupture so much like that of a tubercular abscess, as to be in danger of being mistaken for the latter disease. An example of this kind is related by Mr. Allan Burns:—"A man," says he, "from which several of the most distinguished practitioners of Edinburgh, and almost every surgeon in Glasgow, were consulted. The nature of the disease appeared to be so doubtful, that an operation in the thoracic artery was done, that on that subject there was no difference of opinion. Some were, however, of opinion, that an operation might be performed, while others were fully convinced, that the case was tubercular. For myself, I must confess, that I was fully persuaded, near to the very stage of the disease, an operation might have been beneficial." &c. (*Surgical Anatomy of the Heart and Aorta*, p. 231). After death the vessel which was supposed to have been ruptured, internally affected, was found perfectly healthy.—(p. 25.)

After dealing at the particulars of this interesting case, Mr. A. Burns observes, that "it corroborated Sir James Cooper's theory, that aneurisms of the aorta may assume the appearance of being situated in one of the arches of the neck: an inference drawn from the observation of a case which came under his own observation, and of which he has the goodness to inform, at whose house I was, along with a Dutch physician, of the position of the vessel. In one case, the aneurism was situated on the right side of the aorta, and occupied a part of the artery immediately in Sir A. Cooper's line, the tumor arose from the left side of the arch, from between the roots of the left subclavian and carotid arteries. It formed a flattened, fusiform cyst, the bottom of which projected at the top of the neck, from behind the sternum, and so many vascular anastomoses of the root of the brachial artery, that the practitioner who consulted Sir A. Cooper, actually mistook the disease for an aneurism."—(*ibid.*, p. 232, 233, 234.)

The preceding sentence has received full confirmation from the observation of an aneurism of the aorta. "I have seen," says Mr. Hodgson, "several cases of aneurism arising from the superior part of the arch of the aorta, which protruded above the sternum and clavicles, and in one instance, the space between the sternum and the sternum was so considerably, that it was proposed to tie the curved artery far as posterior, which descending passed in space from the origin of the aorta immediately from the arch of the aorta."—(*On the Diseases of Arteries and Veins*, p. 30.)

As we have already noticed aneurisms of the aorta are most frequent at its curvature; but they are also met with on the other portion of this vessel in the thorax, and likewise on that part of it which is below the diaphragm. In subjects predisposed to aneurism, such swellings are frequently seen affecting various parts of the aorta at the same time.

When the disease occurs in the abdominal aorta, a preternatural dilation generally becomes perceptible at some particular point. The possibility of the latter inference with the direction of the vessels, the breathing is rendered difficult; at the swelling, moving the chest of the diaphragm; the patient suffers of great extraordinary internal pains; sometimes he is affected with convulsions; sometimes with dyspnoea; and one unfavourably with incontinence of the urine and stool. At length an intense external swelling is formed, which increases alternately, and if the patient survives some months, destroys him by a sudden violent termination— *hæmorrhage of blood*.

Aneurisms within the thorax and abdomen, being entirely out of the reach of operative surgery, have been but cursorily attended at an aneurism of the aorta, and when this has been done in vain cases, it has generally been only with a view of palliation. In regard to the three of the circulation by the lungs and the heart, another every thing that may be done to relieve the body, or guard the action of the heart, keeping the bowels well open with laxative medicines, and breathing pure with opiates, have been the means usually employed. Of late years, also, digitalis, which has a positive power of dilating the action of the coronary arteries and increasing the force of the heart, has been prescribed with every appearance of benefit.

That the direction of the arch of the circulation will prevent the rupture of an aneurism, Mr. Hodgson considers is established by the following explanation:

If two sacs exist in the course of the same artery, the aneurism which is caused by the junction of blood into the vessel contains the force of circulation from the lower, much lessens aneurism, or at least it is the lower, much lessens aneurism.—(*On Diseases of Arteries*, p. 143.)

It was this opinion of the celebrated Valsalva, that the utility of a lowering plan of treatment in aneurism, was that merely raised the death of aneurism patients. It was his belief, that the method might be made to such a degree as to be not already very truly such a degree; and he put it forth further with such power and perspicuity, that the treatment he considered as particularly his own. The plan was adopted as it was, devoted to his memory, and was published in the first volume of the *Chirurgia*, one of his two *Historiæ*, and several others, who had heard Valsalva's method, afterwards imitated it in others. Thus, in Morgagni was passing through his hands, in 1726, Morgagni, a physician of the same, is said to have imitated him of Valsalva's plan—also on this subject directing, after Sir. Blandin, p. 1, p. 225.)

After taking away a great deal of blood by venesection, Valsalva used not to diminish the quantity of food gradually, till the patient at length was almost only half a pint of soup in the morning, with a quantity of a pint in the evening, and a very small quantity of wine, mixed with quantity of opium, or with the laudanum. When the patient had been so reduced as to be incapable of getting up at the bed, Valsalva used to give him some anodynes, and the extreme debility then occurred. Valsalva was sure, that some aneurism, that existed, had got well, because every symptom disappeared, and the cure was verified by an opportunity which he had of dissecting the body of a person that had been cured of this disease, and observed that of another aneurism, the artery which had been dilated was found contracted, and in some degree calcified.

Morgagni relates, that the method of treating aneurism is somewhat like the plan which Blandin had used with success, as well as Valsalva, and he is less so in the 28th chapter of the 2d vol. of the *Anatomy of the man*, and in the 2d, cap. 4, of the *Treatise on the Heart and Arteries*, of the other. His title tells us, that in consequence of this instruction, he examined both these works, without finding any thing on the subject. However this may be, he is referred by the latter, that he has seen the greatest effect of the pressure in an aneurism, who had as strong an opinion in front of the horizontal extremity of the circle, in consequence of a sweet-scented in the neck. The patient, after having been bed several times, was confined to his bed, and kept to an extremely low diet. He was allowed to drink only a very small kind of beverage. He took pills consisting of castor oil, and the weight was covered with a sac of aneurism, and which was every now and then well wet with oil. By a perspiration in this treatment, the swelling was reduced to a small hard tubercle, having no pulsation, and a perfect cure ensued.—(*See* *See* *See*, if above by Morgagni, p. 2, p. 170—171.)

Morgagni recommended the application of no water or poultice, but so electrical wrappings; a plan which he represents as being often of itself sufficient to effect a cure. This typical employment of cold applications may be currently and continuously adapted to one patient with Valsalva's practice.

The most interesting and interesting facts in proof of the efficacy of this mode of treatment, were published five years ago by Pelletan. Indeed, upon the whole, I have no hesitation in saying, that I have never read any modern collection of surgical cases, which have appeared in the time of Valsalva, that show with more than Valsalva's, the efficacy of the method of Valsalva. The following extract from a well-written critique on this work will serve to certify the reality of the efficacy of the method of Valsalva. "The lesson in the treatment is to reduce the patient gradually to a state of a degree of weakness as is possible, without immediately endangering life. It is done by absolute rest, a rigorous diet, and bleeding; or, if necessary, by Pelletan adds the external application of ice, or cold and anodyne vapours, &c. The last two

year 1793 and his book was not published until the year 1772.

"Does it ever happen in surgery," says Dr. Hunter, "that when an artery is opened through a vein, a communication, or anastomosis, is afterward kept up between these two vessels? It is easy to conceive how easy, and it is not long since I was convinced almost, that had all the symptoms might be expected, supposing such a union to have actually happened, and such symptoms as anastomosis must be allowed to be very unaccountable. It arose from bleeding, and that of some parts bleeding, when I was about two years ago, and I understood very little anatomy, how I happened to know that took. The vein, at the opening of the artery, and especially the laceration, which was the vein that had been opened, was quite so grossly enlarged, and made gradually to first natural size, at about two inches above and to reach below the elbow. When treated by pressure they did not much about restorable, and light happened, and when a ligature was applied light passed the former, immediately below the affected part. Both when the ligature was made tight, and when it was removed, they shrank, and returned to a small size, while the latter was kept tight above the artery, at the part where the vein had been opened to bleeding. There was a general swelling in the place, and in the direction of the artery, which would have been best stronger than what is natural, and there was a tremendous pain in the vein, which was strongest at the part which had been punctured, and became insupportable at some distance both upwards and downwards." (Phil. Oss. and Inq. vol. 1.)

In the second volume of this work, Dr. Hunter adds some further remarks on the anastomotic parts.

"In the operation of bleeding, the blood is squeezed into the artery through each side of the vein, and there will be three vessels made in these vessels, viz. two in the vein, and one in the artery, and these will be nearly opposite to one another, and to the vessel in the vein. Thus of what all surgeons know has often happened in bleeding, and the injury done the artery is commonly known by the pulsing impetuously of the stream, while it flows from the vein, and by the difficulty of stopping it, when a sufficient quantity is drawn off.

In the first place, we must suppose, that the wound of the skin, and of the adjacent or upper side of the vein, lead up as usual, but that the wound of the artery, and of the adjacent or lower side of the vein, admit upon the wound of the artery more of the venous sanguine, and, by that means, the blood is drawn from the trunk of the artery directly into the trunk of the vein. Secondly, as this supposition may happen, in reality it differs from the venous sanguine, in one circumstance only, viz. the vessel remaining open in the side of the vein, as well as in the side of the artery. The latter circumstance will maintain a great deal of difference in the appearance, in the tendency of the complaint, and in the proper method of treating it; upon which account, the knowledge of such things will be of importance in surgery.

"It will differ in its symptoms from the common species of aneurism, namely, viz. —

The vein will be distended, or become varicose, and a small pale pulsating artery, arising as usual at the extreme down the artery. It will make a beating noise, which will be found to correspond with the pulse of the artery below. The blood of the tumor will be glaucous, or almost entirely fluid, because kept in contact with it. The artery, superadded, will become larger in the vein, and broader at and upon, than it was in the natural state; which will be found, by comparing the size, and the pulse, of the artery, in both states, at these different places. The reason of which I will speak of hereafter, and the effects of ligatures, and of pressure upon the vessels above the tumor and below it, will be what every person may readily conceive, who understands what thing of the nature of arteries and pulse in the living body.

The nature and tendency of such a complaint will be very different from that of the aneurism aneurism. The vein is greatly more every beat, because of the resistance to the arterial blood, and it is retarded by surgery, more so, last beat. The other, is a short noise, comes to a nearly permanent state, and it is not distended, contains no motion, because there is no communicable resistance to the blood that is forced out at the artery.

The proper treatment must, therefore, be very different from that of aneurism, the progress aneurism requiring different assistance, in such, perhaps in any disease, whatever, aneurism, in the other case, I presume it will be best to be avoided.

If such cases do happen, they will, on a whole, be found to differ among themselves, in every little circumstance, and particularly in the shape, &c., of the anastomotic parts. Thus the situation of the vein may be in one only, or in several, and may extend farther higher in one case than in another, &c., according to the manner of branching, and to the state of the veins in different areas. And the direction of the vein may also vary, on account of the size of the artery that is punctured, and of the size of the vein in the artery and in the vein.

Another difference in such cases will arise from the different progress in which the pulse of the artery may be treated or continued with the office of the vein. In one case, the trunk of the vein may keep close to the trunk of the artery, and the very thin stratum of cellular membrane between them may, by means of a thin inflammation and coagulation of the blood, keep its firmness, so it were, solder the two vessels of these vessels together, so that there shall be nothing like a canal going from one to the other; and then the whole operation will be more regular, and more certainly a duration of the vein only. In other instances, the blood that studies from the affected artery, meeting with some difficulty of admission and passage through the vein, may dilate the cellular membrane, between the artery and vein, into a bag, as in a common spontaneous aneurism, and so make a sort of canal between these two vessels. The trunk of the vein will then be removed in some distance from the trunk of the artery, and the bag will be situated chiefly upon the outer side of the vein. The bag may take on an irregular form, from the cellular membrane being more loose and yielding at one place than at another, and from being abnormally bound down by the fibres of the large vessels. And if the bag be very large, especially if it be of an irregular figure, no doubt, evolutions of blood may be formed, as in the common spontaneous aneurism."

As Scarpa correctly observes, a aneurism of any circumstance is possible for the production of an anastomotic vein: 1st, the division in the vein, and that at the artery must be exactly at the same distance; 2d, the nature of continuity to the segments and upper side of the vein must hold, while the vessel in the deeper side of that vessel and the junction in the upper surface of the artery remain open, and anastomosis is necessary that the arterial blood flows greater facility a distance from the artery into the vein, thus is being effected from the artery into the surrounding cellular substance.

If one of these two circumstances be wanting, either because the branching instrument has entered the artery a little obliquely from the vein, or because the vein has not been sufficiently kept to the artery, an amount of the cellular substance between them, the arterial blood must necessarily does not produce the anastomotic vein; or, if it does, the disease is always complicated with effusion of arterial blood into the cellular substance, or with an aneurism and aneurismal vein at the same time. In this case the small anastomotic vein serves as a short canal of communication between the artery and the vein (Med. Facts and Obs. vol. 4, p. 115); two distinct diseases are in fact being formed from the same cause, and placed one after the other, viz. an aneurism and an anastomotic vein. — Scarpa, p. 422, of 2.) The following marks of distinction between aneurism and anastomotic vein are pointed out by the same author: the anastomotic vein always forms a communicating aneurism; aneurism does not always do so. The cellular substance which connects the side of the aneurism does not always move so strongly the progress of the arterial blood as the cause of the vein in. Now, aneurism, therefore, aneurism, aneurism from being communicated at first becomes diffused; extends along the course of the extended artery; enlarges strongly the surrounding parts; contains static pain and inflammation; and the parts are distended with pulsation. On the contrary, the anastomotic vein is always communicated, increases very slowly, does not produce much pain, and, as it increases, it always extends more or less above or below the place where anastomosis

has been torn; and the extension is in proportion to the greater or less force with which the aneurism is thrown from the artery into the vein, and the greater or less resistance made by the vessel situated in the way between the pressure, and according to the pressure or less resistance of vessels communicating with the aneurismal vein. The matter of the aneurism is generally the same vein, though it is sometimes an arterial aneurism, but an arterial aneurism is the case of a Varix, if the disease is recent. In the course of the aneurism is the centre left by the vessel. The vein is less dilated the further it is from the heart, and in general at the distance of two inches and a half from the heart the vessel becomes its natural size. The blood flowing, as has been exhibited, performs like an artery with a beatable pulse, and having some, which is sometimes so great that the patient cannot sleep if he is lying with his head low, and resting on the injured arm. The trunk of the brachial artery, from the axilla down to the place where it has been wounded with the lancet, strikes with extraordinary force. There is no change of colour nor induration of the skin; and the part is painless. The swelling is compressible and yielding; but it returns as soon as the pressure is removed from it. When the arm is kept far above the head, the blood, like the water in a dam, and the drive being stopped when pressure is made on the communication between the artery and vein, so when a slight weight is applied near the axilla. If the disease be complicated with aneurism, a second pulsating tumour will be found lying under the aneurismal vein. (Surgery, p. 424, vol. 2.)

After reading two cases, illustrations of the nature of aneurismal vein, Dr. W. Hunter proceeds to inquire, "Why is the pulse at the wrist so weak, weaker in the dilated arm than in the other? surely the reason is disease of the vein. If the blood can easily escape from the trunk of the artery through into the trunk of the vein, it is natural to think that it will be driven along the extreme branches with less force and in less quantity."

Whereas it is that the artery is enlarged all the way down the arm! I am of opinion, that it is the consequence of the blood passing so rapidly from the artery into the vein, and so much an extension or rupture to all arteries is growing bodies, and on the arteries, at particular parts when the parts themselves increase in their bulk, and at the same time retain a vascular structure. It is well known that the arteries of the human arm reach larger in the time of adolescence. I once saw a fleshy tumour upon the top of a man's head as large nearly as his head; and his temporal and occipital arteries, which fed the tumour, were enlarged in proportion. I have observed the same change in the arteries of children's extremities, &c. so that I should suppose it will be used by us to universally true in fact, and the reason of it is thereby seems evident. (See Med. Obs. and Inq. vol. 2.)

In this aneurism the junction between the vein and the brachial artery, the trunk of which is crossed at a very small angle, that it is almost impossible to see it at this point, without risk of wounding the artery at the same time. The head of the arm indeed is the only position in which the disease is usually noticed. It is easy to conceive, however, that a serious aneurism may happen wherever an artery of a certain character may immediately meet a large vein. Thus, Harvey observes on this, the trunk, superior to the shoulder in humans, and a rule of aneurismal vein, which had been occasioned by a wound of the patient's arm and artery, and that a history of the disease, accompanied with the pathological premonitions, was sent to the Society Royal Academy of Surgery at Paris. "The aneurism swelling, which was as large as two fists, occupied the whole of the arm to a well-developed man, who some years previously had been wounded with a sword in that part of the limb. At a post-mortem, dissection was found necessary, and was performed with success. At the bottom of the rupture, which the communication between the brachial vein and artery was observed. The vein itself was evidently dilated of the vein, the parts of which, adjacent to the rupture, were dilated, especially the lower extremity of the vessel. The patient's arm was rendered flat, like a piece of tape, and adherent to the outside of the vein." (See Med. de Char. N. 2, 3, p. 136.) Sagar,

Trans. Med. Assoc. 3, vol. 2, p. 177.) Two cases are likewise recorded by Mr. Hunter. In one, the disease was caused in the thigh about four inches below Poupart's ligament, by the point of a pointed iron rod, which had passed through the femoral artery and vein, in the same manner, the aneurismal vein was situated in the femur, and was the consequence of a wound in this part with a sword. (See Treatise on the Aneurism of Arteries, p. 108.) Another French case example of aneurismal vein extension under the axilla.

P. Lacroix was wounded with a sword in a ditch, on the skin of his arm, the part of the attachment of the artery-vein junction was divided, the anterior vessels, the brachial artery and vein at a very deep level, and probably plus a portion of the brachial plexus. A good violent hemorrhage took place, followed by syncope. Pressure was applied to the wound, and the patient conveyed to the hospital at Gros-Caillon. The external wound, which was small, did not bleed at all the following evening, but the artery was again opened by a large rupture, which thickened with the aneurism, particularly at its lower part. A positive issue, five that of the passage of a fluid through tortuous muscular tubes, could also be felt more deeply in the direction of the axillary vein. The arm was quite cold, insensible, motionless, and without any pulse even in the axillary artery itself. On the 5th, the tumour was not larger, but its thickness was strange; the superficial vein on the same side was considerably dilated; and the pulsation of the radial and of the arteries of the opposite arm had augmented. A vein in the right arm was opened, and compresses dipped in coagulated vinegar, mixture of arnica, and ice applied to the swelling. It would be superfluous here to detail the diet, bleedings, and other parts of the treatment. On the 6th day, the distal wound was quite healed. On the 10th, the veins of the arm were observed to be swollen, and swelling and warmth were returning in it, though no pulse could yet be felt. The tumour was much smaller, and restricted to a circumscribed place behind the most painful muscle; but the swelling was still present. Hydrogen gas, the nature of the arm and forearm required their power of action. The hand, however, continued insensible, and affected with pecking pains. On the 15th day, the tumour was quite gone; but the healing wound was unhealed, and the hemorrhages were still visible in the veins of the neck and arm. The arm was not at all wounded. On the 16th day, a pulse in the wrist could be slightly felt; the bleeding wound had become less dense; the veins were less turgid, and their pulsation diminished.

A second instance of aneurismal vein, or rather perhaps of a vein of all the veins of the arm, caused by a sword-wound of the axilla, is also recorded by Harvey. He mentions, however, that a pulsation was observable in the most prominent of the enlarged veins. (See Med. de Char. N. 2, 3, p. 241, &c.)

Dr. Harvey of Philadelphia, published a case of aneurismal vein, which is in several respects interesting. A patient was wounded in the leg with a buckshot; and after the cure of the injury, an aneurismal vein was noticed just below the knee; and in a little time the superficial veins of the limb became dilated, and the bounding nodes, characterizing this species of aneurism, could be plainly distinguished. The patient was sent by Dr. Harvey twelve years after the accident; the veins were then considerably distended from the knee up to the groin, all under which later part was actually experienced, and some three situated on the foot and ankle could not be healed by any of the remedies which were tried. The patient was under the care of Drs. Hays and Wistar. The aneurismal distention of the veins of the leg, and the uncertainty of finding out the communication between the artery and vein, led these gentlemen to cut the first of these vessels in the middle of the thigh. Gangrenes soon ensued, and in this state the patient was further weakened by an unexpected hemorrhage from one of the distended veins; and though the wound was secured with a ligature, the bleeding recovered, the patient became more and more emaciated, and at length expired. When the limb was examined after death, the whole of the trunk of the femoral artery was found peripherally dilated; while all the veins of the limb were considerably distended; a bougie could readily be passed from the popliteal into the posterior tibial artery, which participated in the dilatation, and from

this last artery the instrument could be passed into the vein, through a cyst situated on the inside of the leg below the knee.—See *Dever's Elements of Surgery*, vol. 2: p. 218. Philadelphia, 1823.

Professor Harold, Dr. Huxley, Mr. B. Hall, and Dr. Gorman present cases of the numerous forms which assumed malignancy for duration, twenty, and thirty-five years. Several cases are related by Brissaud, Gombault, and Moutier, of a cure having been obtained by means of trepanning. But as this method of cure, if it does not convert, widens the patient to the danger of a complication of the disease with an infection, it ought not to be employed, except in certain cases where the tumor is small, and in almost all patients at an early period of life, and when both of the removal can be satisfactorily converted into the bone.

Two cases are recorded, in which it was necessary to operate in consequence of the disease being joined with aneurism of the artery, and even burning. The case before us, and a negative result took place above and below the aperture in the artery.—*See Park, in Medical Facts and Obs.* vol. 4, p. 111; and *Plowden, in Medical Magazine*, vol. 1, p. 65.

The latter form of the disease, which is particularly noticed by Dr. Hunter, and now by our friend Mr. Hodgson, is readily understood by reflecting that the artery and vein, when positioned together, do not always take exactly a similar as to let the arterial blood have a direct passage into the vein; therefore may be regarded for some distance from an aneurism; so that the blood passes from the artery into the adjacent cellular membrane, where a sac is formed, into which the blood is poured previously to its entrance into the vein.—*See Gibber's Treatise of Surgeries*, vol. 2, p. 125. Philadelphia, 1822.

[illegible]ANALYTICAL DATA: $\text{C}_{10}\text{H}_{10}\text{O}$ 162.14.

This is the form which the late Mr. John Bell, of Edinburgh, applied to a species of acanthium resembling most of the bloody tumours (cancer) sometimes which appear in new-born children, grew to a large size, and ultimately bursting sent a considerable quantity of blood.

Imported introductions of this disease may be traced to writers; though, before the publication of Mr. John Bell's *Principles of Surgery* it was not charged with certainty. That President has recorded a case of this affection for the express purpose of proving that putrefaction is an essential sign of the existence of an abscess.—(*See Canadian Chirurgical Journal*, vol. 1, p. 72.)

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This pigment is a complex of active vitamins such as, according to Dr. John Bell, the cellular substance through which these vitamins are absorbed, resembles the bile of a turkey-cock of the substance of the pla-

coils, spleen, or womb. The irritated and intense action of the arteries fills the coils with blood, and from these coils it is reabsorbed by the veins. The size of the swelling is increased by exercise, drinking, emotion of the mind, and by all causes which moderate the circulation.

In this peculiar disease Dujardin regards the organism as being in an anastomotic state; but, besides this circumstance, he says, these extreme transformations in life is a thousand different ways, absorbing spores, and reproducing carries life those which are found in the corpus ciliatum; and he compares the change to increased activity of the capillary circulation. (*Proceedings of Mr. Huxley's work*, 1, 2, p. 203.) It is observed by Mr. Boyce, that most organisms have followed J. B. in believing that this disease is made of a small cellular structure through which the food passes at its course from the surface and the base. However, he has long been one of those who maintain that the organism only an easily extensible of enlarged vessels. (*Ann. Phil. Med. Jour.*, 1838, p. 724)

In the dissection of a pulsating aneurysm of the aorta in a patient who had died after the operation of tying the common artery, Dr. Macchiacchi found the branches of this vessel on the head - degenerated into dilated veins of extreme thinness and transparency, which apparently resulted from the laceration of the blood, as because elongated, contracted, and ultimately moved on themselves, as can be seen by this sample of drawing the structures which constituted this singular aneurysm. They all lay passively, and the larger portion (especially over the carotid) presented black masses of extravasated coagulated blood. (See *Glasgow Medical Journal*, vol. 1, p. 53.) Two cases are given by Pottius, fully contrasting the true nature of the nature of the disease by Dr. Macchiacchi and Mr. Jones. (See *Glasgow Chron.* 3, 2.) Boyer, who saw one of these cases, describes all the arteries of the neck as being dilated, varicose, knotty, and strongly variegated in some places, in others contracted. (Threat. des Mal. Chir. 2, p. 285.) In the aneurysm described by Dr. Macchiacchi some of the cords spoken of by Mr. John Bell were found, as parasymples, as in the spleen; the bulk of the aneurysm was formed almost entirely by enervated dilated arterial trunks, the veins being but one channel from their healthy state. He adds, that these arteries did not appear to communicate more freely than by their ordinary innervations. Some of these communications, as it appears to me, require interpretation by a careful anatomical inspection of the vessels.

In the female subject the menarche began the day after by amenorrhea in some cases a strikingly irregularity, as the following example illustrates. *Ann Venable*, of 8, Maury, in Rome, was born with a tumour on her chin, of the size and shape of a small strawberry, without pain, heat, or discoloration of the skin. As it produced no troubles for some months, however, it excited little interest, particularly as it did not seem to increase with the growth of the child. For the first fifteen years there was but little attention; but about the menstrual period it increased rapidly to double the size, and became more elongated in form. A quantity of red blood was observed to issue from its extremity. This fact, because, indeed because, painful, and sometimes was sufficiently annoying to produce an alarming degree of weakness. Each period of its return was preceded by a violent pain in the head and vertebrae.

Before and after the appointment of these appointees there was no alteration in the size of the cabinet; the only difference was a small rearrangement of the ministerial teams, with an increase of two in the just, his- torical state degree of *Neoliberalism*.

The reviews at length took place, but in unavailability and at irregular periods, without establishing any fixed discharge from the Hospital at the frequency of the examination.

The bracts were not enlarged till a last floral, but did the structure of properly seem to have an arrest toward inclusion on these glands. At—(See *Parsons Clem. Journ.* vol. 5, p. 78, 74.)

As far as any observations external, the true meaning by autoanalysis is a disease with which a surgeon should never interfere; and if it is decided to try any kind of surgery, the only feasible plan is either a complete removal of the disease with a limb, or leave the limb attached which supply the owner with food.

The first is the strict mode of relief, and should be preferred, when not forbidden by the magnitude or situation of the tumour.

In performing such an operation, as Mr. Wardrop remarks, the surgeon should avoid entering into the substance of the tumour; for if this be done, the haemorrhage is violent; whereas, by making the incision beyond the diseased structure, the flow of blood is much more moderate. (*Med. Jour. Trans.* vol. 9, p. 523.) In a few cases pressure may be safely tried; but all attempts to get rid of a true aneurism from spontaneous by external I should think by no means advisable.

"This aneurism," Mr. John Bell observes, "is a true character of active vessels, which will not be cured by opening it; all attempts to obliterate the disease with caustics after a double incision, have proved unsuccessful; nor does the interposition of particular vessels which lead to it affect the patient; the whole group of vessels must be extirpated. In various years, or in moments of individual ardour, or in extraordinary efforts of blood, such as that produced under the scalp from blows upon the temporal artery, or in those enormous protrusions of aneurisms by pulling the hair, and also in the bloody effusions from sores of the head which have a distinct pulsation, the process of cutting up the vessel, aneurism, or arteriole, enables you to obliterate the vessel and perform an easy cure. But in this enlargement of inextinguishable vessels, in the aneurism by anastomosis, the rule is, 'not to cut into, but to cut it out.' These people are bloody, impatient, because they are large, boisterous, painful, covered with sores, and bleeding, like a vessel in the last stage of ulceration, have been led too often to proposed cures, terrible bleeding cauteries, and the mistakes which I have made, while they tend in some measure to explain the nature and consequences of the disease, will remind you of various unhappy cases, where either partial incisions may have been practised, or the patient fell entirely to his fate." (*Principles of Surgery*, vol. 1.)

That Mr. John Bell has comprised in his account of aneurism by anastomosis certain two-thirds called upon nature be assisted, not, indeed, are the differences between this kind of aneurism and some cases in all defined even by the best writers on surgery. To the consideration of these, however, I have alluded in article, in which the method of extirpating particular forms of the disease by means of a ligature will be explained.

The following case, recorded by Mr. Wardrop, affords a valuable illustration of the nature and situation of one form of this disease. A child was born with a very large subcutaneous tumour on the back part of the neck. It was of the form and size of a hen's ordinary egg. The tumour had been daily increasing; and when Mr. Wardrop saw it, two days after birth, the skin had given way, and a profuse hemorrhage had taken place. The swelling was very soft and compressible; when squeezed it yielded like a sponge, and was reducible to one-third of its original size. On removing the pressure, however, the tumour rapidly filled again, and the skin recovered its purple colour. "Considering the immediate situation of the tumour the only chance of saving the infant (says Mr. Wardrop), I removed it as expeditiously as possible, and made the incision of the integuments beyond the boundary of its tumour; aware of the danger of hemorrhage, where such tumours are cut into. No profuse, however, was the bleeding, that though the whole mass was easily removed by a few incisions, it bled freely.

The tumour having been injured by flowing colour of the skin a few of the larger vessels, its entire structure could be accurately examined. Several of the vessels, which, from the thickness of their coats appeared to be rather more of a large size, and there was one sufficiently large to admit a full-sized ligature. This vessel was quite as large as the carotid artery of an adult. The boundaries of the tumour appeared distinct, some healthy cellular membrane, traversed by the blood-vessels, surrounding it. On tracing these vessels to the diseased mass, they penetrated into a spongy structure composed of numerous coils and curls, like a variety of ferns and wires, all of which were filled with the injection, and communicated directly with the ramifications of the vessels. These

cells and fibres had a smooth and polished surface, and in some parts resembled very much the surface of the heart, others crossing them in various directions like the coronary tendons. The opening in the skin, through which the blood had escaped during life, communicated directly with one of the large coils, from which the largest vessel also passed." (*Wardrop's Med. Jour. Trans.* vol. 3, p. 255.)

In the section on Cerebral Aneurisms I have mentioned the cases in which Mr. Travers and Mr. DeGraaf cured aneurisms by anastomosis in the artery tying the branches of the artery. Professor Palmer also cured an aneurism anastomosing location of the chest and neck of the body by taking up the carotid artery. (*See Med. and Phys. Jour.* vol. 6, July, 1822.) These facts prove that aneurisms by anastomosis, like many other diseases, sometimes admit of being cured on the principle of cutting off or lessening the supply of blood to the part affected.

However, surgeons must not be too confident of the efficacy of this to cure the disease, by tying the main artery from which the swelling receives its supply of blood; and the great cause of failure is the impossibility of preventing it, under circumstances, the maintenance of a considerable quantity of blood into the tumour, through the anastomosing vessels. A case is recorded by Hennen, in which he applied a ligature for three days to the carotid artery, and obliterated it; yet the tumour affected seemed to be only temporary, as in a short time the tumour was as large as before. (*See Med. and Phys. Jour.* vol. 18.) In fact, every vessel, artery, and vein around the disease seems to be enlarged and turgid, and the anastomoses are so intricate that no plan of the circumference of the swelling can be imagined which is free from them. Extreme pain was born with two small red marks on the anterior of the right ear. Until the age of twelve years the chief inconveniences were a sensation of itching about the part, occasional bleeding from it, and the greater size of this part of the right ear. The disease soon extended itself over the whole anterior, and to the back and cheeks; and the upper part of the ear became twice as large as natural. Slight, trifling climatic and constitutional changes began to be perceptible in the tumour, which was of a red colour, and covered by a very thin skin. Soon afterwards its accidental rupture of the patient's hat was sufficient to cause copious hemorrhages, which were difficult to suppress, and at the same time that they produced great weakness, caused a temporary diminution of the tumour and its pulsation. At length the disease began to raise up the scalp for the distance of an inch around the most anterior, and the hemorrhages to be more frequent and abundant. Pressure was next applied to the frequent, carotid, and occipital arteries; but as the patient could not endure it, the first two of these vessels were tied, the only benefit from which was a slight diminution in the pulsation and bulk of the swelling. This treatment did not prevent the return of hemorrhages, and therefore forty-three days after the first operation a ligature was applied to the occipital artery, which was found to be equally inefficient. As the disease continued to make progress, the patient entered the Hôpital St. Louis, on the 9th of April, 1818. Dr. Dupuytren tried what effect tying the trunk of the carotid artery would produce on the swelling. As soon as the ligature was applied, the throbbing ceased, and the tumour underwent a quick and considerable diminution. On the fifth day, slight impressions and continuance of the diseased part of the ear were again perceptible, though the swelling had diminished considerably. An attempt was now made to compress the tumour by covering it with plaster of Paris, a plan which was somewhat painful, though it lessened the size of the tumour. After being six days in the hospital, the patient was discharged, at which period the tumour was diminished one-third; the throbbings had returned, but no unpleasant noises continued to affect the ear. (*See Anecdotes* of Mr. Hennen's work, t. 2, p. 238.)

An infant, six weeks old, was brought to Mr. Wardrop, on account of an aneurism by anastomosis (a subcutaneous tumour) of a very arterial size, situated on the left cheek. The base of the tumour extended from the temple to beyond the angle of the jaw, completely enveloping the cartilage of the ear. At its upper part there was an ulcer, about three lines in diameter, presenting a disgusting appearance. The tumour was

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ANTHRAX (anthrax, a burning coal). See **LOCKSMITH**.
ANTHONY'S PILL (see **ANTHONY'S PILLS**).
(Dissolve Anthrax and some Phosphate Salts). In all cases where it is desirable to increase the secretions in general, and those of the kidneys, skin, and alimentary canal, in particular, it is proper to have recourse to antithyroid remedies. In the administration of these fluids and its ingredients, and in that of the greater regularity of organs of the importance in the system, antithyroid should be exhibited. For an adult, from two to five grains of pure anthrax may be ordered, and the dose, if possible, may be repeated three or five times a day. In order to increase the action on the bowels, it is desirably combined with castor oil.

Of late, doctors have argued concerning the efficacy of amniocentesis powder. Dr. Edmunds having prescribed it this is the dose of 100 cc. apparently without any effect. Mr. R. Phillips has suggested to explain the circumstances by the preparation of amniocentesis being the powder, which is known to be inert.—*See Journal of Pharmacy for Dec. 1971. Pharmacologia by Dr. Paris, a M.C. vol. 6, no. 5, 1971.*

ANTHOSIUM MURIATUM, (Warrior of Auto-
momy.) Employed as a rivulet.

ANTIMONI SULFURETUM PRÆCIPITATUM.
An ingredient in the compound colicid pill, and before prescribed in any other form.

ANTIMONIUM TARTARIZATUM. (*Emetic Tar-*
tar.) Of this useful medicine, the best preparation is
the vitriol antini tart. every half ounce of which
contains one grain of antini tart. Tartarized ant-

many, in the case of gr. 1, will, if the sun is kept warm, produce a staphylinus; gr. 2 will produce some staph. dark and sweating afterwards; and gr. 3 will generally make something, these perhaps, and finally pupation. In very moist soils, as gr. 3, 10 or 12, combined with sand and sugar-cane, it will be an exception. As Mr. Perry justly remarks it is decidedly the most profitable, and the best method of all the other experiments, and the quantity would probably have not failed to equal, were all the other combinations of interest discarded from the pharmacopoeia.—(See Pharmacopoeia by Dr. Ross, vol. 2, p. 67, 68, 69.)

Terminated latency is sometimes followed with further spreading, especially if the initiating release and possible of the target tissue, thereby re-initiating the infection. (See Discussion.)

ANTHRAX. *Bacillus* ϕ . This clostrid is fatal in a variety of diseases. Sometimes the virulence is high, inflammation, and necrosis are accompanied by systemic effects of toxins; at other times, in consequence of inflammation at other centers, it is the seat of various endocarditis, polypl, and flaps. Even the toxic portion of the anthrax are occasionally effected with mucous abscesses. Sometimes it contains enormous fungus, and it is even described that insects may be generated there, and cause. As heavy virus, very afflicting man.

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Inflammation of the middle-ear, being, in the ordinary cases, produced by an extraordinary secretion of mucus, within which the collected fluid being confined, the body partakes of the cavity being expanded to a surprising degree. This disease, says Robert, is sometimes accounted for a blow to the eardrum, or to the tibia, or the projection of one of the teeth into the antrum. But in general, the cause takes place unperceived by any of these causes, and without there being the least ground for suspecting what has given rise to the disorder. It is remarked, however, that soldiers some of whom walk in the streets are soon seized with young abscesses of three puncta sort by Boyer, the abscess was not more than two—(Frost, *see Med. Clin.* t. 6, p. 129.) As Mr. Hunter has noticed, whether the obtaining of the fluid leading to the nose, be a cause or only an effect of the disease, is not easily determined; but from some of the symptoms, there is great reason to suppose it an antecedent. "If it be a cause, we may suppose that the natural expanse of these cavities, accumulated, mucus, and produces inflammation for its own sake, in the same manner as an obstruction to the passage of the urine through the ducts of nature produces an abscess of the urinary sac."—(See Boyer's *Natural Hist. of the Urine*, p. 174, ed. 3.) The most interesting example of the effects of the impediment of mucus in the antrum, is that recorded by Delius; a boy, between seven and eight years of age, was observed to have at the base of the ascending process of the upper jawbone, on the left side, a small, very hard tumour of the size of a nut. As it gave no pain, and did not appear to increase, his parents did not consider him any concern about it. When he was about sixteen, however, the swelling began to increase, and to be somewhat painful. Before he was sixteen, an inflammation was so considerable that the flow of the saliva was caused up by it, the eye thrown upwards, the palpitating which ceased; the neck of the patient passed down in the form of a tumour; and the nasal airway closed. Below the orbit there took place a collection of pus, which the nose was directed towards the opposite side of the face, and the skin at the upper part of the tumour, below the lower orbit, was of a purple red colour and threatening to burst. The upper lip was drawn upwards, and bent in all the places as the left side were observed to project much farther than those on the opposite side of the face, and at this point came the tumour at the very surface of the nostril was perceptible. The patient spoke and breathed with great difficulty; he slept uneasily, and his countenance was painful. The case was first suggested by Delius, Schaefer, Pottius, and Boyer, to be a fungus of the antrum, and an operation was considered suitable. In proceeding to this measure, the first thing which attracted the notice of Delius was a sort of tumour in the situation of the great brain of the upper lip; a circumstance which led him to give suspicion of the

case being a fungus, though he expected that, on making an opening, merely a small quantity of wheaten matter might escape, affecting at first no inflammation. In this place, however, he determined to make an incision along the alveolar process, whereby a large quantity of a glutinous substance like lymph, or what is called a mass of fungus, was discharged. A probe was now introduced, with which Dubois could feel a white equal in extent to the thickness of the tumour, and in moving the instrument about, with the view of ascertaining whether any fungus was present, it struck against a hard substance, which felt like one of the lower teeth, near the opening that had been made. Five days after the first operation, Dubois exhibited two tumours and one granule, and then removed the corresponding part of the alveolar process. As the incision was not profound, the wound was soon filled with drainage, which in two days came away, and dried before it closed, with hardly any loss of the vitality of the cavity. At its upper part, he perceived a white spot, which he supposed was just left on healing it with a probe, it thrust out to be a tooth, which was then extracted, to show which was the bone was irregular. The rest of the treatment merely consisted in drying the cavity, and applying caustic drugges. It seems not unlike all the better cases I have seen, but the swelling of the cheek and pain, and the displacement of the nose, with exception. In the course of another year and a half, however, every vestige of debility was entirely restored. (*Dubois, Archives de la Faculté de Médecine*, 12, No. 3.)

With respect to the treatment of collections of matter in the antrum, by means of incisions, through into that cavity through the natural opening at it, while the head is inclined to the opposite side, for the purpose of facilitating the escape of the collected fluid, as proposed by Jourd'ain in 1765 (*Mém. de l'Acad. de Chir.*, t. 4, p. 357), Deschamps and Boyer are of opinion that the method is objectionable, not only because it is difficult to find the aperture, which, on the disease being an upward swelling, is probably obliterated, but also because the thickness of the mucous membrane would make it impossible for the surgeon to push it out with injections. Hence, Boyer approves of the practice of opening the manner in an oblique position, and so as not to afford for the discharge of the pus. (*Deschamps, Traité des Maladies des Parties Nées de la tête*, t. 3, p. 331, 332, 333, 334; *Boyer, Traité des Acad. Chir.*, t. 6, p. 145, 146, 147, 148.) Indeed, that Deschamps's proposal was attended with too much difficulty for common practice, was the sentence long ago pronounced upon it by a treasurer of the Royal Academy of Surgeons in France, maintained for the express purpose of injecting into the mouth of the suggestion. The method of making an opening into the antrum, will be considered in the sequel of this article. As a general rule, I may here remark, that except when a fungus or fungus begins to be extruded, or a foreign body to be extruded from the antrum, it is quite unnecessary to remove any part of the alveolar process, or cut away any of the bony parties of the antrum; the drawing at one of the teeth situated below this cavity, and making a perforation in this situation, being the only kind of opening required. This aperture may be enlarged as long as necessary, by the introduction of a piece of elastic gum catheter, which is to be fastened to the adjacent teeth, and through which the surgeon to the antrum may escape, or incision be injected. (*Deschamps, Traité des Mal. des Parties Nées de la tête*, t. 3, p. 331.) However, as Hister remarks, if the height of the tumour has destroyed, even though the case be merely a collection of mucus or pus, an opening may be made to the inside of the lip, but not accurate at the difficulty of maintaining such an aperture. It will however be the purpose of drawing out of the mouth. (*Waring, Hist. of the Teeth*, p. 176, et. 2.)

If all the dissections, however, are by the most accurate. Yarned there on the cheek, and necessary affections of the adjacent parts, and especially of the pterygoid, extending along the nostril, capable of being cut away, and, above all things, the teeth, may bring on inflammation and suppuration within the cavity of the upper jawbone. The first operation is removal of any part of the alveolar process, and particularly of those should be a vigorous tooth at the point of the jaw. Each part, however, extends more

into the ribs, than that usually does which arises from a decayed tooth: it also affects, more or less, the eye, the orbit, and the situation of the frontal sinus. (*Waring, Hist. of the Teeth*, p. 175, et. 2.) But even these symptoms are insufficient to characterize the disease, the nature of which is not invariably affected till a much later period. The complaint is, in general, of much longer duration than was formerly supposed, and on a closer look, and its violence is more or less, and, at last, a hard tumour is perceptible below the cheekbone. By degrees the swelling extends over the whole cheek; but it afterward flows in a point, and leaves a very irregular, hard, and, which may be felt above the back of the teeth. The symptoms is accompanied with redness, and sometimes with inflammation and suppuration of the adjacent parts. It is not uncommon, also, for the outward sinuses to participate with that within the antrum.

The characteristic direction of the tumour, however, does not occur in all cases. There are instances in which the matter makes its way towards the palate, causing the bones of this part to swell, and at length rendering them carious, unless directly procured to give. There are other cases in which the matter escapes between the lips and cheeks of the mouth. Lastly, there are certain examples, in which the matter formed in the antrum makes its exit at the nostril of the alveolar. When the patient is lying with his head on the opposite side to a low position. If this mode of exit should be frequently repeated, it prevents the tumour both from pointing externally and breaking, as it would, do if the patient were could not do so. But this evacuation of pus from the antrum is not very common; for, according to Mr. Adams, the opening between the nostrils and cavity of the antrum is generally stopped up. He even seems inclined to think, as I have already observed, that the disease may sometimes be occasioned by the imperious state of the opening, in consequence of which the natural mode of the antrum collects in such quantity, as to irritate and inflame the membrane with which it is in contact, just as an obstruction in the ducts of the pancreas the passage of the fluids into the nose, and causes an abscess in the lacrymal sac. This is a point, however, on which even Mr. Adams would not venture to speak with certainty; for it is by no means impossible that the suppurative stage of the opening is rather an effect than the cause of the disease, since inflammation in the antrum is often manifestly produced by causes not at all distant from, and since the opening in question is not invariably closed.

Abscesses in the antrum require a free exit for their contents, and if the surgeon neglects to procure such opening, the bones become more and more destroyed and pushed out, and finally carious. When this happens, the plan makes its suggestion, either towards the orbit, the alveoli, the palate, or, as is mostly the case, towards the cheek. The matter having thus made a way for its escape, the disease now becomes stationary.

In all cases, whether the pus be simply confined to the antrum, or whether the case be complicated with a general affection of the bones, the principal indication is to discharge the matter.

The ancients seem to have known very little about the treatment of Abscesses of the antrum. Boerhaave, an English manuscript, is reported to be the first proposer of a plan for curing abscesses of this cavity. (*Antropologia Nova*, London, 1725.) However, M. Moreau was much earlier in proposing, with the same intention, the extraction of one or more of the teeth, in order that the matter might have an opening for its escape through the sockets. This plan may be compared with success. The gum frequently has a tendency to make its way externally towards the teeth; it often affects their fangs; and, after their extraction, the whole of the alveoli is soon to escape through the sockets. But this very simple plan will not suffice for all cases; as there are numerous instances in which there is its continuation between the alveoli and the antrum.

Drake, and perhaps better than Cooper, was of the opinion of the insufficiency of M. Moreau's method, and hence they proposed making a perforation through the socket into the antrum with an awl, for the purpose of letting out the matter, and injecting into the cavity with fluids as were judged proper.

M. Jourd'ain recommended in the French Academy of Surgery, the insertion of detached bones into the

through opening of the nostrils, by means of a curved pipe introduced into the nostril; but, without dwelling upon the difficulty of effecting this method in practice, especially where the opening is closed, many must on the authority of the French surgeons themselves, that the more employed use of operations is not in those cases an efficient mode of treatment.—(See *Brit. Med. Journ.* 1851, p. 283.)

In the treatment of abscesses of the nostrils, the extraction of bone is never tried, and the perforation of the alveoli, being generally essential steps, we must consider what steps ought to be taken out in preference to others.

A corner, or even a more forward abutting, of any parietal bone, in general, tends to develop the disease. But if at the teeth should be sound, which is not often the case, writers direct us to lay each of these firmly, and to extract that which gives most pain on this head done. When no information can be thus obtained, great consideration ought to guide us.

All the greater teeth, except the first, correspond with the nostrils. They open sometimes beyond into the cavity, and the fangs are only covered by the parietal maxillae. The bony lamina which separates the nostrils from the alveoli, is very thin towards the back part of the upper jaw. Hence, when the disease is in that power, it is best to extract the third or fourth grinder, as in this situation the alveoli can be more easily performed. Though, in general, the first grinder and canine teeth do not communicate with the nostrils, their distal approach on each side of it, and from their work on covering very readily be extended into that cavity.

When one or more teeth are carious, they should be removed, because they are both noxious and painful. The matter frequently makes its escape as soon as a diaphragm is destroyed, in consequence of the fang having extended into the nostrils, or even as a consequence of its bulging away with it a piece of the thin partition between it and the cavity. Perhaps a discharge may follow from the partition itself being carious. If the opening thus produced be sufficiently large to allow the matter to escape, the operation is already completed. But as it can easily be enlarged, it ought always to be so when there is the least suspicion of its being one-sight. However, when the pus makes its appearance after a tooth is extracted, the alveoli must be opened or enlarged by a pointed instrument in the direction of the alveoli. Some use a small spear or awl, others a graver for this purpose.

The patient should sit on the ground in a slanting light, resting his head on the surgeon's knee, who is so at least his eye. Immediately the instrument has reached the cavity, it is to be withdrawn. The entrance into the nostril is easily known by the cessation of resistance. After the matter is discharged, surgeons advise the opening to be closed with a wooden stopper, in order to prevent the entrance of extraneous substances.

The stopper is to be taken out several times a day to allow the air to escape. This plan most depends the patient affected to discontinue the suppuration, and restore their natural state. Sometimes, however, the pus continues to be discharged for a long time after the operation, without any change occurring in regard to its quality or quantity. In such instances, the cure may often be accelerated by employing syringes of bread and water, lime-water, or a solution of the sulphate of zinc.

Some surgeons prefer a silver canula, or a piece of glass pipe either, instead of the stopper, as it can always be left pervious except at night. The canula on round, where the extraction of a tooth and the perforation of the bottom of the nostrils were the means of curing abscesses of that cavity, are very rare.—(See *Parvelli's Medical Cases*, No. 5; *Good's Cases*, p. 18, note; *Edinb. Med. Journ.*, 1851, p. 10.)

If no coming were made in the nostrils, the matter would become so very viscid towards the front of the cavity, which is very thin; sometimes towards the mouth; and fistulous openings and canals would inevitably follow.

When the bones are diseased, the alveoli plug will not accomplish what must be effected by the use of bone substitute. A probe will generally guide us to detect caries in the nostrils. The first cause and obvious appearance of the disease, when there is little doubt that the bone is diseased, and in proportion to the

bones free themselves of any dead portions, the discharge has less smell and its continuance becomes thicker.

When there are loose pieces of dead bone or other foreign bodies to be extracted, it is requisite to make a larger opening in the nostrils than can be obtained at its lower part. Instances also occur where patients have lost all the growing teeth and the sockets are given softness, so that a perforation from below cannot be effected. These practitioners object to carrying a sound tooth. In these circumstances, it has been advised to make a perforation in the nostrils above the alveoli process: a method first suggested by Lennet. It consists in making a transverse incision below the nasal process and above the root of the third grinder. Then the gum and pericosteum are divided and the bone exposed. A perforating instrument is to be introduced into the middle of this incision, and the opening in the nostril made as large as possible.—(See *M. de l'Acad. de Chir.* t. 4, p. 251; *Good's Obs.* append. p. 125.) There are some extensive suppurations of the nostrils where it is absolutely necessary to expose a great part of the wall of the bone, and to lay open the nasal process which are united, as it were, in the alveoli. A small incision may sometimes be advantageously applied to the nasal process of the superior maxillary bone.

Surgeons formerly treated cancerous affections of the nostrils in the most stupid and unscientific way, introducing severs through the cavity, and then having recourse to the actual cautery. The moderns, however, are not much inclined to adopt this sort of practice. It is now known, that the destruction of a dead portion of bone, is either before the process of epithelization, is healthy, or not entirely the work of nature, in which the alveoli are a very delicate part. Indeed, he should limit his interference to providing the ingress of matter, maintaining strict cleanliness, and removing the dead pieces of bone as soon as they become loose. But it is to be understood, that extraneous bodies present themselves, in which the dead portions of bone are so intense of separation, and are obliged to be withdrawn at the surrounding living bone, that an attempt may properly be made to cut them away.

SOURCES OF THE ANTRUM.

Boeck, Barthez, Desault, Abernethy, Weiskind, and others, have recorded cases of polypus, fungous, and cancerous diseases of the nostrils, and examples of this cavity being affected with exostoses.

The existence of any ordinary fleshy tumour in the nostrils, while it is an incipient one, certainly tends to conceal its existence; but such a disease rarely occurs without being accompanied with some affection of the neighbouring parts; and hence, as previously may possibly be ascertained before it has attained such a size as to have altered, in a serious degree, the natural shape of the nostrils. This information may be acquired, by examining whether any of the teeth become loose, or have spontaneously fallen out; whether the alveoli process be diseased, and whether there are any fungous excrescences making their appearance at the sockets; whether there is any unusual bleeding from one side of the nose; any carcinoma tumour at the side of the nostril, or towards the great angle of the eye. When the swelling, however, has attained a certain size, the bony portions of the nostril always protrude, unless the body of the tumour should be situated in the nostril, and only the root in the nostril. This case, however, is very uncommon.

As soon as a tumour is certainly known to exist in the nostrils, the front part of the cavity should be opened, without waiting till the disease makes further progress. In a few instances, indeed, we may avail ourselves of the opening which is now and then found in the alveoli process, and enlarge it sufficiently to allow the matter to be withdrawn. If the front of the nostril were freely opened, it would in general be better to cut away the disease in its interior.

A swelling of the process of the nostrils is considered of an abscess, or a carcinoma, though in the cavity, may lead to its rupture through an enlargement of the bones, or an exostosis. The symptoms of the first two affections have been already detailed. One sign of an exostosis, besides the absence of the symptoms characterizing an abscess of a sinus, is

outlet of the external surface of an abscess after delivery should be an examination of all the natural outlets of the rectum.

The point in which the extremity of the rectum, or the anus, ought to be, may be entirely or partly shut up by a contraction of fleshy adhesions. In other instances, no swelling of the membrane can be formed, as the skin retains its natural colour, and the whole mass between the parts of protraction and the os coccygis, without being upon elevated in one place than another. In these cases, the intestine sometimes terminates in air, or *per-ædæ-mat*, about as each sigmoid flexure from the ordinary situation of the anus.—(See *British Medical Journal*, N. S., Vol. 6.) Sometimes it does not descend lower than the upper part of the rectum, sometimes it opens into the bladder or vagina. Dr. Palmer dissected a man where the colon, after reaching the flexure of the left kidney, began, as it descended, to form a sigmoid flexure, and previously to its arrival at the os coccygis of the left ilium, made a valvular turn to the right; and crossing the psoas muscle, reached the peritoneum of the rectum, where it terminated, instead of at entering the pelvis. With this malformation was combined an imperforate vesicular urethra, and other considerable deviations of the genital organs from their natural situation.—(See *Medical-Chir. Journal*, vol. 1, Nov. Lond. 1818.)

Sometimes the *colon* terminates in a way and the rectum is entirely deficient.—(See *Burgard*, in *Journ. de M. d. l. 1, 66*.) Instances are also upon record where the rectum opened into the uterus.—(See *Nov. 1719*, p. 772; *Hist. de l'Acad. Royale des Sciences*, 1720, p. 113; *Recherches de M. de Willebrord*, 1760, pp. 15; 1763, No. 13; *Recherches de M. de Willebrord*, 1760, pp. 15; 1763, No. 13; *Recherches de M. de Willebrord*, 1760, pp. 15; 1763, No. 13.)

When a surgeon is consulted to treat not less much time as dissection; for if a speedy operation be not made for the fever, the patient will certainly very soon perish, with symptoms similar to those of a strangulated hernia. Mr. C. Hathorn claims it, however, advantages not to operate till the expiration of from twenty-four to sixty hours after birth, as within this period no great inconvenience will arise, and the distention of the rectum with mucus is a guide to the surgeon in making the incision.—(See *Doc. in Surgery*, vol. 2.) After ascertaining the complaint, which is an easy matter, the surgeon should endeavour to learn whether the anus is really shut by a transverse or fleshy adhesion, or whether the anus is altogether missing, in consequence of the fever, or from the cavity of the gut being obliterated or the rectum not extending sufficiently far down.

When a membrane or production of the skin closes the opening of the rectum, the part producing the obstruction is somewhat different in colour from the surrounding integuments. Its form is of a purple or livid hue, in consequence of the arrestedness of the mucus on its inner surface. The membrane, propelled downwards by the visceræ above, forms a small reddish prominence, which yields like dough to the pressure of the finger; but immediately projects again when the pressure is removed. When a fleshy adhesion closes the intestine, the circumstance is different to this, if the part protrude, as is generally the case. The finger feels greater hardness and resistance than when placed in a mere membrane, and the livid colour of the membrane caused by mucus through the obstructing adhesion.

These last signs alone are enough to convince the surgeon of the necessity of the operation; for they do not clearly show whether the intestine descends as far as it ought in order to form a proper kind of anus. Complete information to this point can only be acquired after the membrane or adhesion has been divided, or else after the child's death, when the operation has proved ineffective. Though there be no death to denote where the same ought to be situated, and no degree of protrusion, yielding like soft dough to the pressure of the finger and rising again when such pressure is removed; yet it may happen, especially on one being conducted immediately after the child is born, that notwithstanding the absence of such symptoms, during the presence of the mucus, and the natural colour of the intestine, as far as where the tube ought to be, the gut may extend into a cavity as far as the membrane or adhesion closing it.

When the anus is completely covered with skin, and its place indicated by a premature protrusion from the con-

tests of the rectum, we have only to make an opening with a knife, sufficient to let out the mucus. Later, however, a circular incision in the membrane, or membrane, is sufficient. A small bit of oil is afterwards to be introduced, in order to keep the opening from closing. If the anus be only partly closed by a membrane, the opening may be dilated with tents or bougies; but if the aperture be very small, it is preferable to use the bistoury for its enlargement.

When an external appearance denotes where the extremity of the anus ought to be, the case is much more serious and embarrassing; and this, whether the intestine be stopped up by a fleshy adhesion or the obliteration of its apices, or whether a part of the gut be wanting.

However, it is the surgeon's duty to do every thing in his power to effect relief. For this purpose, an incision an inch longer rather more is to be made in the situation where the anus ought to be, and the wound is to be carried several more deeply in the external rectum of the intestine. The cuts are to be made directly upwards, not at the side of the penis, for the vagina or bladder might thus be wounded. On the contrary, the operator should yet backwards, along the convexity of the os coccygis, where there is no danger of wounding any part of importance. In all cases of this kind the surgeon's finger is the best director. The operator, guided by the index finger of the left hand, is to insert it into the intestine within the os coccygis, is to depend on the direction above recommended, until he reaches the feces, or has cut as far as he can reach with his finger. If he should fail in finding the mucus, as I have said, unavailingly follow, one more attempt might be made by introducing, upon the finger, a smaller and firmer, in the direction last indicated, to reach the rectum without danger to other parts, viz. upwards and backwards. The contents of the rectum may be let out in the perineum, and secured there by lint, which is used as a guide for the finger. In some observations on this subject, addressed to the Medical and Chirurgical Society by Mr. Charles Hathorn, he recommends an elastic gum catheter to be substituted for the finger after a week, and when the tube can be disposed with a sponge tent or piece of bougie, as in which 12 and 14 hours.—(See also *Doc. in Surgery*, vol. 2, 1808.)

In a very interesting case, recorded in *Lancet*, it was surgical history, the importance of the case was not discovered till the evening of the 11th day from the child's birth, when through and communications had come out. M. Wood found the abdomen preternaturally hard, and painful when handled, and when examined, and great depression of strength proved. Next day, he introduced a large barrel a few inches into the depth of the os coccygis of an inch without finding the mucus. The patient was then turned to the depth of two inches without effect. With a pharyngeal, however, he soon succeeded in passing the rectum; and a glyster was administered, which brought away some mucus. Under the use of clisters and tents the child soon recovered.

In such proceedings many infants have been preserved, which would otherwise have been devoted to certain death. Hathorn, La Motte, Blandin, M. Crotier, Hathorn, and others have successfully adopted the practice. Mr. B. did not with freedom, in which the intestine was very distant from the perineum, and he was so successful as to form a fistula, which yielded its contents freely to the finger, but he found it exceedingly difficult to keep the passage sufficiently permanent. As soon as he removed the help of his hand, and other kinds of tents, used the necessary assistance, with a degree of continuance speedily followed, that the evacuation of the rectum not being so very difficult for a long while afterwards. He employed, at different times, tents made of sponge, gutta serena, and other substances, which went as long as was needed. But they always produced no effect, and he argued that it was impossible to persevere in their use.

Tents of very soft lint, dipped in oil, or some of the same kind, cause less irritation than those composed of less elastic materials.

Though keeping the moving clister was some service and may to some extent have had no opportunity of doing more or less, it is far otherwise in practice. Mr. B. did not mean to, that he never met with any disease that gave rise to such a state of

embarrassed as he experienced in the two cases of the wart which occurred in his practice. Although in both instances he made the openings at first sufficiently large, it was only by very anxious attention for eight or ten weeks, that the necessity for another operation, and even repeated operations, was prevented. When only the skin has been divided, the rest of the treatment is, of course, more simple; for then nothing more is requisite than keeping a piece of wax for a few days in the opening made with the knife. But upon the extremity of the rectum as in a certain instance, though the anus generally hopes to effect a cure, after having succeeded at going, too, in the previous anal, yet the treatment after the operation will always demand for a long while a great deal of attention and care on the part of the surgeon. In a highly interesting example, recorded by Mr. Milne, of Montreal, such was the tendency or closure of the new opening, that he was obliged to repeat the operation. Mr. Vaux before the child was eight months old.—(*See Med. Rev., Journ. No. 48, p. 62*.) Notwithstanding all these operations, and another one of some kind and three-quarters' duration, performed several years afterward, the stricture of an almost constricted canal is said to be a cartilaginous, the power of the sphincter was perfect. The efficacy of surgery only to be considered as in some measure proportioned to the depth of the stricture involved. In a case like that recorded by Dr. Palmer, in which I have above adverted, the laxity of any attempt to disengage the fibres by an operation at the anal side of the stricture is, as I have said, almost—(*Medico-Chir. Journ. vol. 1, p. 194.*)

Consequently, while the *area* appears peritoneal and well drained, actually under the same symptoms as if there were no *area* at all. The reason of this depends upon the formation being occasionally closed by a membranous partition extended more or less upwards, above the aperture of the ureth. (Conrad, *Nocturnal Incontinence*, p. 147; of John Wombey, in *Edin. Med. and Surg. Journal*, April, 1811; and Cases in Hirschman's *Obs. in Surgery*, of 2), and sometimes the symptoms are owing to the formation of the gut in a cleft sense. This erroneous formation may always be suspected upon an infant, whose *area* is externally open, does not void any excrement for two or three days after its birth, and especially when urgent symptoms arise, such as swelling of the belly, vomiting, &c. We are now to endeavour to ascertain whether the reason is imperforation above the *area*, by attempting to inject glysters or to introduce a probe. If the gut is straight there is nothing to be done but leaving prepared to the method described above, and forming a communication by means of a bistury passed on the finger, or else with a pharyngotome. If the obstacle should only consist of a transverse membrane, the operation will be easy and its success highly probable. But if there should be a *diaphragm* or obstruction of the *aperture*, the case is actually more severe.

In the case recorded by Mr. Wingo, the diarrhoea began was felt by the father about six weeks from the birth of the babe. It was paired with a gonorrhoea which was followed by a hydrocoele trosser, and afterward by a fungus of larger dimensions. On withdrawing the latter, much mucus was found with some blood, and continued to be frequently discharged. In a week, however, the opening closed, and a fresh patient was made, which was unattended by the foregoing introduction of fungus. The child provided tolerably well until the end of another week, when the passage was again much contracted and the abdomen proportionately distended. On the 20th day from birth, a full-sized penis was used for restoring the opening, which, however, again had a tendency to close, the man afterwards being obliged to introduce twice a day bougies, which were introduced in size until a constant course of dilations would be required. The boy now rapidly improved, and every sign of a gonorrhoea was eradicated, but because of the oscurity the case, and at the end of six months the little patient died hectic. (*Am. Edin. Med. and Surg. Journ.*, vol. 17.)

When the skin is dissected, the intestine sometimes opens into the vagina or bladder. (Dumas, in *Revue P. l'analyse de la Soc. de Med. t. 3, No. 13, 1840*; *Rapport du Thénar* et la Soc. Philom. vol. 1, p. 145. *Murres, Mem. de la Soc. des sciences*, 1811, 1784. *Act. Med. et vol. 6, Obs. 34, vol. 9, (Obs. 1).* *Kloster, in Marrocco's Jour. f. d. Chir. d. 1.*

547. *Obs. Bot. Dered. V, No. 2.* The first case is the least dangerous of such malapropisms. The intestines may also be divided at two places at the same time, viz. at the nasal place, so as to form a proper suture more or less perfect; and also in the vagina.

If these two openings would be large enough for the easy evacuation of the excrement, nothing can be done on tender 20 days, far enough visiting the Jews (though the vagina is a most magnificent instrument), yet there is an efficient means of avoiding the opening of the intestine in this situation, nor could one be devised which would not seriously compromise the infant.

But when the two openings are exceedingly small, and the active ingredients (anhydrous calcium chloride, for example) are not in the form of a fine powder, the opening of the straw must be filled by means of a different device. If this method should not avail, the knife must be employed, and the wound dressed as already explained.

For the same part the intestine has only one opening in the vagina. In this circumstance, we see the intestine in which the feces have to exit at all, we must make an incision in that place where the same might be necessary. The natural course of the feces being opened in this opening, which in such a case is not at all painful, because less muscular wall pass out of the vagina, and of course the intestine will be discharged. 6) the introduction of a tube into the lower strait, the communication between the rectum and vagina might possibly be destroyed, and a better cure accomplished. The opening between the intestine and vagina may also be too small for the easy evacuation of the feces, and recti expose the infant to the same sort of dangerous symptoms as would occur if the rectum had no opening at all.

In male infants, the prepuce sometimes opens into the bladder, and in this circumstance there is generally no pain. The fluid is easily known by the mucus, being streaked with the urine, which acquires a thick greenish appearance, and is voided almost continually enough in small quantities. Only the most fluid part of the mucus is in this discharged. The thicker part not getting from the urethra into the bladder, nor from the bladder into the urethra, greatly diminishes the irritation and bladder, and produces the same symptoms as take place in cases of total impaction. Hence, without the speedy interference of art to keep it from capable of giving vent to the urine, with which the urinary organs cannot remain obstructed the infant will inevitably die. This case must, therefore, be treated like the foregoing examples. Though we can hardly hope to prevent altogether the inconvenient urination from the prepuce opening into the bladder, we may even a few passages will not completely hinder the urine from following the other course; yet we shall thus avert the cold and very bad chances of preservation, and the only one which its situation will allow.

In cases in which an outlet for the feces cannot be obtained by any of the methods pointed out above, it has been proposed by Littré to make an opening above one of the pikes, find out a portion of intestine, open it, fix it in this situation with a few stitches, and thus form an artificial anus. Substituting this very un-pleasant with one case in which the proceeding had been actually done, viz. the example where Ducrest, a French naval surgeon, operated. This gentleman told us the accident at the lower part of the left iliac region, and having opened the sigmoid flexure of the colon, he fixed it near the navel. "The child was saved by the formation of an artificial anus; but at the age of twenty-five months it continued to be troubled with a sort of prolapsus of the lining of the bowel." (See *Richard's Encyclopedia for Nov. 1864*, 2, 4, No. 19; and *Substit. Med. Dictionary*, 1, 2, 4, 266, 1, 10.)

An instance has been published by Mr. Price, in which he made an opening in the osseous part of the sigmoid flexure, in a lady, who, in consequence of a serious disease of the osseous part, was afflicted with an enormous and painful distention of the intestine, causing the patient to survive the operation nearly sixteen months, at the end of which time she fell a victim to the disease of the uterus. (*New London Medical and Physical Journal*, vol. 45 and 46.) I should be inclined to offer any remarks concerning the propriety of this practice, against which various considerations present themselves, particularly in cases where, besides a severe difficulty of evacuating the bowels, another dis-

size exists, which is itself likely to destroy the patient, and in a certain not capacious of receiving any additional blood from the blood operator, procured in the example related by Mr. Hume.

Cullen conceives that the discharging vessel may be, most conveniently, probed by making an incision in the left iliacus rectus, along the edge of the quadratus lumborum muscle; and he defines the mode of operating so that of making the incision above the great right iliac blood vessel, 1, 2, p. 686; the, also, book. The discharging, however, are not obvious. (See Noddy's *Medical Observations*, f. 3, p. 320. Poppendorf, *de Anæsthesia imperiosa*, Lipsæ 1785. Remarquar sur l'Effluve des Vaisseaux de l'Anus, par M. Pott, in *Mém. de l'Acad. Royal de Chir.* 1, 3, p. 225. *ibid.* in *Ann. II. J. Williams, de præsentatione et cures fistulæ Recti signa vera præsentia, et independenter Anæsthesia*, in *Gall.* 1778. *Med. et Chir. Facts and Obs.* vol. 1, No. 16. *Chondriasis, in Memoirs of the Med. Soc. of Lond.* vol. 5, No. 22. *Richmond, Næsthesia*, *Chir.* 1, 3, p. 327, 4. c. edit. A. G. *Wentworth, Edin.* *Med. Trans.* vol. 11, Janu. vol. 1, p. 124. A. C. *Næsthesia*, in *Pract. Obs. in Surgery*, ed. 2, 1799. *Müller, in Edin. Med. Journ.* No. 56, p. 61. *Jalard, de l'Anæsthesia*, *M. d. par Lemery*, 1, 22, p. 173.)

ABSCESSES OF THE ANUS.—FISTULA IN ANO.

The nature of giving the application of fistula to every collection of matter formed near the anus, has, by conveying a false notion of facts, been productive of such methods of treating them, as are diametrically opposite to those which ought to be pursued.

A small abscess or boil, from a large or deep cavity, discharging a thin glut or stasis, tends, as Mr. Pott has explained, a considerable part of the idea which our ancestors had of abscesses were, wherever caused. With these notions they always connected a notion of callosity; and therefore, whenever they found such a kind of opening, yielding such sort of discharge, and attended with any degree of tenderness, they called the complaint a fistula. Supposing this callosity to be a diseased alteration made in the very structure of the parts, they had no conception that it could be cured by any incision but by removal with a cutting instrument, or by destruction with escharotics; and therefore they immediately attacked it with knife or cauter, in order to scoop out of these parts; and very terrible work they often made.

That abscesses formed near the fundament do sometimes, from bad habits, from extreme rage, or from gross alimentary, become fistulous, is certain; but the majority of cases have not at first any one characteristic or mark of a true fistula; but rise, without the most exact neglect on the side of the patient, or the most ignorant management on the part of the surgeon, degenerate or be converted into one.

Collection of matter from inflammation (wherever formed), if they be not opened in time and in a proper manner, do often burst. The hole through which the matter discharges is generally small, and not often attended in the next observation or some disposition part of the abscess: it therefore, is said for the discharge of all the contents of the abscess; and instead of closing restricts itself to a smaller size, and becoming hard at its edges, continues to drain off what is furnished by the diseased sides of the cavity.

When an abscess near the anus bursts, the suppuration of the local office: the tenderness of its edges; no being fixed to let the matter from a deep cavity; the daily discharge of a thin, gloey, discoloured kind of matter; and the migration of the parts round about, have all contributed to raise and confirm the idea of a true fistula.

Abscesses about the anus possess themselves in different kinds.

Sometimes the attack is made with symptoms of high inflammation; with pain, fever, rigor, &c., and the fever subsides when the abscess is formed.

In this case a part of the lymph near the anus is considerably swollen, and has a large circumscribed fistulous. In a short time the middle of this hardness becomes hot and inflamed; and in the centre of it matter is formed.

This (on the language of our physicians) is called in general a pimple; but when it appears in this particular part, a pimple.

This pain is sometimes great, the skin tight, the tumour large and constantly tender; but however disagreeable the appearance may have been, it however keeps the symptoms may have some salutary operation, yet when this and is finally and fully superseded, the patient generally becomes easy and cured; and the matter formed under such circumstances, though it may be plentiful, it is good.

On the other hand, the internal parts, after such pain, attended with fever, rigors, &c., are sometimes attended with considerable inflammation, but without any of that circumscribed hardness which characterizes the preceding nature; instead of which the inflammation is extended largely, and the skin seems in suppuration kind of appearance. In this the disease is deeper-seated; the quantity of matter small, and the cellular membrane grows to a considerable extent.

Sometimes instead of either of the preceding appearances, there is formed in this part what the French call a suppurative granulation; in which the cellular and adipose membrane is affected in the same manner as in a carbuncle.

In this case the skin is of a dirty red or purple kind of colour; and although tender than when in natural state, yet it has, by no means, that degree of tenderness or heat, which it has either in pimple or in carbuncle.

The patient has generally, at first, a hard, full, painful pulse, with great thirst, and very frequent evacuations. If the progress of the disease be not stopped, or the patient relieved by medicine, the pulse very changes into an unequal, loose, intermitting one; and the strength and the spirits sink to such manner as imply gradual and insensibly impending death. The matter formed under the skin, as observed in small is quantity, and bad in quality; and the abscess continues to progress and enlarge throughout the extent of the inflammation. This generally happens in persons, whose habit is either naturally bad, or has been relaxed by intemperance.

Sometimes the disease makes its first appearance in the induration of the skin, near to the verge of the anus, but without pain or alteration of colour; which hardness gradually softens and suppurates. The matter, when let out, in this case, is small in quantity, good in quality; and the cure is superficial, clean, and well attended. On the contrary, it now and then happens, that although the pain is but little, and the inflammation apparently slight, yet the matter enlarges in quantity, bad in quality, extremely offensive, and proceeds from a deep cavity below.

The place also where the abscess points, and when the matter, if let alone, would have its way, is various and uncertain. Sometimes it is in the middle, at a distance from the anus; at other times, near the verge, or in the perianth; and this discharge is sometimes from one orifice only, sometimes from several. It may indeed be not only as coming through the skin externally, but matter through the fissures into the cavity: in either, there is no difficulty, and that either external or internal.

Sometimes the matter is forced at a considerable distance from the rectum, which is not even last long by it; at others, it is not last long, and not perforated. It is also sometimes not only drained, but poured; and that in many places than one.

All consideration of preventing suppuration is necessary out of the question; and our business, if asked at the beginning, must be to moderate the symptoms; to forward the suppuration; when the matter is let out, to let it out; and to break the ways to such manner as shall be most likely to produce a speedy and lasting cure.

When there are no symptoms which require particular attention, and all that we have to do is to assist the nature of the nature, a soft pouice is the best application. When the disease is that of the phlegmonous kind, the thinner the skin is suffered to become before the abscess is opened, the better; as the induration of the parts about will thereby be the more dissolved; and, consequently, there will be the less to do after such opening has been made. This kind of tumour is generally fixed in people of full, sanguine habit; and who, therefore, at the time the great, and the fever high, will bear evacuation, both by phlebotomy and a rice cathartic: which is rare when the case of those, who are said to be of bilious constitution.

first member of the family, which must have lived in St. Elizabeth's Hospital, within three or twelve years. I do not deny that, that I was not met with in the environment before described, that has not been noted by many people. However, whether with light, my drawings, and that I have seen, in all that time, which for this purpose, a small group of people, in an old house, in the city.

Let us now express the music which the theory of Poincaré himself has made its point, as it is called; and to do so by the text.

Where each point is, that is, where the skin is most dry and the hairless most palpable, the opening most readily made is by using a sharp needle with a cutting movement, not sliding, as with a safety razor.

When a discharge splits, it is not being deflected or misdirected; it makes its own way out, by tearing the critical parts somewhere near the "neckline" or by eroding and making a hole through the neckline and the armpit — or sometimes by both. In either case, air-discharge is made sometimes by one way only, and sometimes by more. Those in which the nipple has to be escaped by water-moist openings through the skin only are called *blind internal fistulas*; those in which the discharge has been made into the cavity of the ducts, without any orifice to the skin, are called *blind internal*; and those which have an opening both through the skin and into the air-moist cavities are called *double*.

Thus, all these cases are detected situations, often hardly any of them ever are so; and most of them becoming. They are still mere abstractions, which are based without the help of art; and, if taken power and kindly care of, will require no such treatment as a true friend who monthly must be used of.

The most frequent of us knowing are called the blind externally and the complete. The method whereby each of these attains the knowers is, by introduction: he probes into the sides by the surface of the skin, while the forefinger is resting on the crown; this will give the exposure an opportunity of knowing exactly the true state of the nose, with all its deformities.

Whether it is the skin that is called "eczema" (itchy skin) or not, that is, whether there be an "eczema" in the strict, medical, or otherwise, and whether in the latter case, the appearance of the skin is such as to cause "eczema" (itchy skin) of the former, the essential condition is the same: the inflamed redness of the skin disappears, the scales, which at first was sticky and that, after a day or two are passed, become more and more as if it were the discharge, by drying the parts about, restores the natural skin surface.

As this kind of sweating seldom proves sufficient for a cure (though at sometimes does), the leprography, in some degrees avoided, and if the urines happen not to be a dropping one, some part of the matter lodged, and is dissolved by intervals, or may be ejected still by the fingers of an excretor. The disease, in this state, is not very painful, and it is treacherous, easy, and effusive. The continual discharge of a thin kind of fluid from a mucous canal, and violent excoriation in the parts above, it avoids the limbs of the patient; and it, at times, very fluid; the urine also sometimes contains so much as not to be sufficient for the discharge, and the tenderness of the micturition ceases from discharge.

The means of data proposed and justified by our discussion were those, for example, ligature, and non-

The innovation in each of these is the same, viz. to form an array of the water and asbestos by laying the fibers into the water. The QWC 190 are now completely, and most accurately, classified.

Whitely no longer considered the disease either as an ailment from which the patient has been let out by an indulgent, facile or a cunning; or from which the consolation has been dispensed by one still so weak, formed by the bartering of the vital sentiments about life's enjoyment. Let us have later notice of a patient, instead of this still speaking, there are several.

This state of the case generally happens when the quantity of material collected has been large, the information of considerable extent, the papers numerous, very complex, and the time very short before it must be turned in. It is, indeed, a circumstance of so real consequence at all; but being so misunderstood, to see properly attended to, is made one of the most terrible

to the patient, and additional stains to the tissues viewed
practitioner; for it is largely, and frequently believed,
that each of these lesions is an evil in itself, or leads to,
a distinct virus, or disease; whereas, in truth, the cause
is most commonly quite effluvia; all these eruptions
are only secondary signs, heralds of the war now
being waged; and, so to say, they for or deny, lead
and open immediately into the one single event of the
disease: they neither indicate, cure and so we are
caused by, distress or assist; nor would the appearance
of twenty of them (if possible) necessarily injure them
than one, or even before.

In the second, for a true one, it will follow, that the treatment of this kind of case ought to be very little, if at all, different from that of the preceding; and that of that may be necessary to be done, may be to divide each of these grilles in such manner as to make one cavity of the whole. Thus the proboscis will easily and expeditiously do; and afterwards, if the pore, or more properly osicles, should make a very small, narrow aperture, the removal of a great number of such ungraceful angular parts will answer all the purposes of making room for the application of dressings, and the procuring a smooth even surface after the sore shall be healed.

When a considerable quantity of matter has been removed by the scalpel, and the external parts are set well in a circle, discoloured matter, but having not yet had time to collapse and approach each other, the inside of each cavity will appear large; and if a probe is pushed with any degree of force, it will pass in more than one direction into the cellular substance by the side of the incision. But let us let the expectorated practitioner be allowed all time, and immediately fancy that there are so many distant lesions, neither let him, if he be of a more liberal disposition, go to Wood's *Anatomical* with his director, blade, or scissors; let him enlarge the external wound by making his incision freely; let him let all the separate cavities open into that cavity; let him divide the tarsus lengthwise by means of his finger in two, let him done lightly and easily; let him pay proper attention to the sides of the patient, and pull and see what a few days, under such conduct, will produce. By this he will frequently find, that the large cavity of the abscess will become small and clear; that the inflammation round about will gradually lessen; that the probe will suppose to find no more into the cellular substance; and, consequently, that the force of a multiplicity of discharges were gradually. On the contrary, if the sore be treated as directed with irritating or escharotic medicines, all the appearances will be different; the hardness will increase, the lips of the wound will be inverted, the cavity of the sore will become large, crude, and foul; the discharge will be thin, slow, and discoloured; the patient will be uneasy and febrile; and, if he were crutches are turned by the irritation of pain and confusion of manner, yet the original use will have the opportunity of oversteering itself, and may very possibly become truly fatal.

Sometimes the matter of an abscess, formed just as even, instead of sucking its way out through the skin externally near the wings of the arm, or in the back, perforates through the internal only. This is what is called a *bone* internal abscess.

In this case, after the drainage has been made, the greater part of the inflammation subsides, and the patient becomes easier. If this does not produce a cure, which sometimes though very seldom happens, some small degree of inflammation generally remains in the lungs where the original linear scar; upon pressure on this lamina, a small discharge of matter is frequently made per aram; and sometimes the rupture of air from the cavity of the abscess and that of the arteries may very painfully be felt and easily heard; the vessels, particularly if large, and retaining force to be expected, are sometimes secured with matter; and although the patient, by the healing of the abscess, is relieved from the severe pain which the existence occasioned, yet he is seldom perfectly free from a dull kind of oppression, especially if he has not any considerable length of time in one posture. The great difference between this kind of case and that in which there is an external opening (with regard to method of cure) is very essential; for an external opening must be made, and then all difference ceases. In this, as in the former, no cure can reasonably be expected until the cavity of the abscess and that of the system are made

Mr. Travers has related, this is sometimes the best mode of relief.

"In the ordinary situation of peritonitis (within peritonitis has formerly designated, the position of incision sustained by the structure *cecalis* in position shortly passed. Their contiguous edges partially adhere, or the remainder of their circumference they adhere to the peritoneum, living or dying of the structure. The existing adhesion of the contiguous lines strengthened by the adhesion of the parts in contact, form a partial continuity upon the sensibility of the subperitoneal part. The line of incision is the lowest structure. It commences on that side of the gut which is in direct contact with the structure. As the operation advances, the opposite adhesion sides may perhaps extend somewhat, and a little, escape the circle of vessels. But it is never allowed to reach, back, where the peritoneum is delicate, the circle is simply covered in by granulations from the cellular substance of the peritoneum, uniting with those of the external or cellular surface of the peritoneum." (On the Progress of Nature of Peritonitis, *Lectures of the Anatomists*, p. 200.) It may be claimed, that both operations have contributed as favorably accurate ideas of the changes which Nature makes the wounded in the first position of incision, when an artificial one is produced; and, though Bland's *incision was circular*, as far as it went, it was not until the year 1823, when Scarpa published his valuable work on the Bland, that the wisdom of nature as such operation was completely elucidated. The Bland was (page 44) some how always parallel of peritonitis with the vessels contained in a tumor, and even when it does slough, slough the situation of the dead parts happens on the outside of the abdominal ring, there almost always appears in this situation a portion of the neck of the tumor perfectly sound. It may be said, therefore, that in all cases, immediately after the destruction of the intestinal intestine, whether it happens within or on the outside of the ring, the two orifices of the gut are enveloped in the neck of the Bland, which, soon becoming adherent to them by the effect of inflammation, serves for a certain time to direct the feces towards the external wound, and to prevent their effusion in the abdomen. In proportion as the enteric wound diminishes, the internal portion of the neck of the Bland is also consumed; but, that part which embraces the edges of the intestine, gradually becomes longer, and of length forms a kind of membranous, funnel-shaped, imperforate cavity, which enables the communication between the two parts of the bowel. However, according to Scarpa's explanation, this adhesion of the neck of the Bland and, round the two orifices of the gut, does not hinder the feces from gradually passing the ring, and becoming more and more deeply placed in the cavity of the abdomen. The idea of the above-described funnel-shaped membranous cavity, corresponds to the Bland, and its apex tends towards the wound or orifice.

But in relation to this part of the subject, there are some other circumstances, which every surgeon should well understand, and his ignorance of them would be extremely on the ground of their not having been, like the funnel-shaped membranous cavity, leaving the communication between the two orifices of the bowel, only a diameter of recent date; for they were fully exposed many years ago. I have already to the exact position of the two portions of the bowel, with respect to each other, the direction of their vessels, the angle or ridge between them, and the difference in their diameters. The first of these circumstances, viz. the position of the two parts of the bowel, was correctly described by Marshall, and, as we have seen, pointed out by Mr. Travers, who requires them to be occupied a position easily parallel, and calls an interesting observation recorded by Pigeot. The patient was a woman, 45 years old; the loop of sigmoid gut was three feet six inches long; the substance of the bowel when cut through the wound for a considerable time, and an artificial anus was established. Some accidental obstruction occurred; a purgative was given, which operated in the natural way; and, in fifteen days, the wound was healed. She lived in perfect health to the age of 61, when she died of a disease not connected with this injury. Pigeot presented the body, and has given a figure representing the union.

The liver, the stomach formed an acute angle, when in adhesion, to the peritoneum, opposite to the central arch. The right side is evidently much contracted. Pigeot particularly directs upon the angular position, and comparison of the tube at the point of union. The lower contraction of the intestinal tube was also limited, to be more contracted than the upper portion; a circumstance correctly referred to by Mr. Travers, in the isolated state of the bowels, situated between the artificial and the natural anus. (See *Ann. de Chir. et de Chir. 1844*, p. 104; and *Travers on the Progress of the Intestine*, p. 204.) The two ends of the bowel, as Scarpa has observed, are always found lying in a more or less parallel manner by the side of each other; the upper, with its convex aspect, and directed towards the external wound by the feces, which issue from it; while the lower, which gives passage to passing, becomes less convex, and is introduced farther into the abdomen. Hence, the bowel in the abdominal cavity is never supported by the action of the upper and lower portions of the bowels meeting, embracing, and resting, as it were, side each other. Instead, they pass at a very acute angle; the side of one does not correspond to that of the other; and their sides lie in nearly opposite each other. It is at short by means of the funnel-shaped cavity, formed by the means of the Bland, that the two parts of the bowel communicate, and the feces, in order to get from the upper into the lower contraction of the intestine, must first pass in a serpentine track through funnel-shaped cavity; there being between the edges of the bowel, directly opposite to the communication between the ends of the intestine and that of the funnel-shaped membrane, a considerable projection, projecting such, forming a natural abdominal obstacle to the direct passage of the feces from the upper into the lower portion of the intestinal tube. (See Scarpa's *Ann. de Chir. 1844*, p. 104; and *Travers on the Progress of the Intestine*, p. 204.)

Bland, after pointing out the efficiency of the adhesion, between the upper part of the bowel and the edge of the opening in the peritoneum in the abdomen, in preventing extravasation, remarks, that though adhesions are valid, the abdominal peritoneum would form a natural for the portion of the canal which has been destroyed, and the contents of the bowel would continue to pass on itself towards the anus, if the junction in the intestine, separated and adherent to the peritoneal parts, did not form such an acute angle as obstructs the passage of the intestinal matter. The more acute this angle is, the greater is the obstruction; when the two parts of the bowel lie nearly parallel, the entrance into the lower portion of the canal is completely prevented, but, if they meet at a right angle, then more or less of the contents of the upper portion may be introduced into the lower. The first disposition chiefly happens, when a considerable part of the intestinal canal has been destroyed, or when the tube has been completely divided; while the second position is principally remarked in all cases where the injury has been less extensive. And it is plain, that the possibility of a cure depends materially on the kind of angle at which the two portions of bowel meet, and the the position of the intestinal function, or failing mechanism edge between the two orifices, is always a greater or less obstacle to the cure.

With respect to the direction which occurs in the diameter of the part of the intestine united between the artificial opening and the natural anus, Bland notices the contraction of the obstruction, but entirely directs from within without or from within at the entrance, as sometimes proceeding so far, that an intermediate distant portion of the intestinal tube is the consequence. The factors involved within it, surface is presented (this contraction is a contraction which, in this case, is capillary, and is partly caused by the contact in the form of white lines. And if any further proof were needed, that the bowels between the artificial and natural anus resemble peritonitis, it will be added by the fact, that in cases of artificial anus, the lower contraction of the tube frequently becomes inverted, and protrudes. On the other hand, the kind of contraction above spoken of, has never been demonstrated by dissection; it was interrupted by Lenoir, in the contraction of the body of a person, who died twenty years after the entire extirpation of the majority of the peritoneum, but just it found to exist by the

small, when he ejected a patient who died of marasmus in the Hotel-Dieu, at consequence of an artificial anus, which communicated with the rectum, and had lasted two years. — (*Gazette de Médecine*, t. 4, p. 231 — 235.)

Hæmorrhoids proper are sometimes an artificial anus may be in many cases, in which the patient's life depends upon the event, it would be continued that the consequence is a most distressing and disgusting disorder. This kind of anus is formed, though the feces which are discharged, from not having time to be converted in the intestine, into a solid mass by compression and evaporation in the rectum. As the event, which gives rise to hæmorrhoids is not the direct result of some degeneration at the lower end of the intestine, and as, in particular, it is not connected with any extensive disease of structure, and retains itself as a disease requires, this form is essentially curable without any knowledge of the conformation of the part of the patient. Hence the salutary state of the anus during the critical opening; and they frequently external, hæmorrhoids. — Some persons in this state, usually the subject of those whose hæmorrhoids are cured, make use of a rectal fist, in which their excrement was retained. — Sometimes, indeed, the case of an officer, who was wounded in the rectum, and who allowed his feces to escape into a vessel made for the purpose. — (Hæmorrhoids a similar case.)

Mucous also communicated to the Analogy of Surgery the history of a wounded man, in whom an artificial anus took place, in consequence of a wound in the sigmoid flexure of the right hypochondrium. His recovery was used to be effected, as a few days, followed by that with a fist. The wound received a better opening, in which the rectum was accommodated.

Uncertainty is not the only inconvenience of an artificial anus. Persons have been known to be quite distressed by the effluvia, and even ultimately to die in consequence of it. This is liable to happen, even after the artificial canal is opened very high up, so that the patient escapes before fermentation is completed, and the nutritious part of the food has been taken up by the hæmorrhoids. In this circumstance, the patient becomes emaciated, and sometimes perishes, as Broussais had an opportunity of observing; and examples of which are also recorded by Boerhaave and Le Boer. In cases of this description, the matter would have little time, and is frequently vomited. In all instances, the matter is evacuated immediately, because there is nothing like a sphincter. But when the opening only connects the lower extremities of the intestine, or, what is more frequent, when it has occurred in the large intestine, the danger is less serious, and persons in this state are often noticed performing all their functions very well; and, with the exception of pain, to which they are subject, enjoying as good health as they are previously to their having the present disease. In such examples, the matter would be more fluid, its discharge does not follow so quickly, its introduction into the rectum, and it is retained here longer time.

Many patients afflicted with an artificial anus void to them at all from the rectum; but occasionally, a thick whitish substance, which is the natural secretion of the portion of the large intestine adjacent to the anus. Under certain circumstances, the quantity of this mucus discharged is more copious. — (*ibid.*, vol. ii, p. 226.)

The most pleasurable occurrence to which persons with an artificial anus are exposed, is a prolapsus of the bowel, similar to what sometimes happens through the anus, with regard to the rectum. The descent of the bowel is sometimes simple, only affecting a portion of the intestinal wall just above the lower opening. On other occasions the complaint is double, the bowel first descends and below the opening being protruded. This descent of the intestine being averted, the distension of the rectum very considerably in different positions. When the protrusion is caused by the upper part of the intestine, the rectum is voided at the extremity of the finger, and when the swelling occurs at the lower portion of the bowel, the hæmorrhoids are evulsed at the base of the protruded part. If observing this, it is found that the hæmorrhoids are double, it is easy to know in which part of the intestinal canal such protruded portion belongs. This consequence of an artificial anus is very common, because it greatly increases the hæmorrhoids when the patient suffers. Sometimes the hæmorrhoids are frequently caused; and

occasionally, when the evulsion of the intestine is considerable, a strangulation is produced, which puts the patient's life in danger.

I apprehend no well-attended surgeon, of the present day can doubt that formerly the frequency of artificial anus after surgery was seriously increased by the effluvia sometimes emitted by the system for the purpose of preventing them; and as Mr. Trevisan has rightly observed, the mucus reported by the patients, if they present any thing, prove this. "That the rectum had been very generally treated, when the artificial anus was introduced upon an emergency, and that when an obstructions had been at work to prevent a sufficient amount of active interference with the arrangements of nature, the case has terminated in artificial anus, so that the event either may have been a result of exposure to the surgeon. The fear of doing any harm, or the desire, applied only to the permanent features of distending the structure, dysphagia, dysphagia, and so forth, the intestine; the general adoption of which practice lately accounts for many cases for the creation of artificial anus, which are the sequelæ of hæmorrhoids." — (*Op.*, vol. 2, p. 207.)

The treatment of an artificial anus in other patients is different. The first consists in allowing the hæmorrhoids to protrude, and in preventing the discharge of the hæmorrhoids, and in preventing such bad symptoms as may arise from the disorder.

The first indication is fulfilled by the employment of silver or tin anastomosis, which are either kept applied to the external opening by means of a spring, or form themselves into a ring at the end of the artificial anus, from which the intestinal matter is transmitted through a tube, kept constantly in the opening. In general, says Desault, an elastic tube is simple, light, and capable of taking any shape, it is the best material for the construction of such instruments, which, however, rarely answer their purpose completely, and always give the patient a great deal of trouble.

As for the second indication, Richter, with the view of hastening the complete escape of the intestinal matter, and the death of the patient from this cause, proposed covering the opening for a certain time with a piece of sponge, supported by an elastic bandage or truss. But Loeffer found this method objectionable, as it was apt to bring on colic, constipation, and an inflamed excoriated state of the skin.

When the anus opening is disposed to contract too much, and hæmorrhoids arise from this change, Richter is an advocate for preventing such change by means of a stick or silver of silk, introduced into the aperture, and changed very often for the sake of cleanliness; and afterwards under a ring of linen for the purpose. But the irritation produced by the matter involved by this sort of effort, and in particular the facility of the bowel to protrude, and be strangulated in the opening of the every ring, are found among objections to these practices; and according to Desault, the sponge employed by Richter also becomes a great deal of excoriation by the irritation of the feces which is lodged in it.

For the purposes of hastening a protrusion of the gut, or keeping the opening sufficiently previous, of relieving any tenderness and constriction, or keeping the intestinal matter from stopping in the intervals of vomiting, and causing a loath enough for the adequate maintenance of the patient, Desault proposed a linen test or support covered by equal elastic, compresses, and a tight bandage. At first, says he, the patient feels some tenderness from this plan, and slight colic may be the consequence of it. But, by degrees, the parts become habituated to their new state, and every thing goes on well. With respect to the employment of water and plugs with the hæmorrhoids, when introduced, I am disposed to think the practice not quite so objectionable; and that any tendency for it may be relieved by attention to diet, and the occasional exhibition of some laxatives and cathartics, as well as to moderate motion. When the gut protrudes, the rectum is to be exposed in the same way as in a strangulated hernia; but some difficulty will occur when the protruded part is inflamed, thickened, and of considerable size. Indeed, surgeons have usually regarded the protrusion as unprofitable in these circumstances; but recently, but in Desault's this is not the case, as compared with a bandage, kept up for some days, will succeed. Care must be taken, however, to keep a sufficient opening

introduced one of the blades of the speculum into each portion of the gut, and closed the instrument with the screw. The part of the instrument inserted externally to the ridge of the anus, being covered with ointment and a compress. The compression was soon followed by colic pains and tenderness in rectum, complaints which were quickly relieved by stimulating the belly. They recurred, however, the instrument became loose, and some discharge ensued. On examination, the speculum was found to be partially directed. After the breadth of the instrument had been increased it was applied again; but when the screw was turned, the patient began to suffer such violent pain over the whole of the abdomen, that it was necessary to discontinue the pressure; and as the instrument was afterward removed from the rectum in a fit of vomiting, it was withdrawn. A trial was now made to determine the force towards the rectum by pressure on the external opening; but this could not be resisted, and the hindrance to the action of the intestinal matter which compresses it was discontinued. As the faeces voided by the sigmoidæ were still not taken sufficient hold of the speculum, six days it properly, the instrument was successful always. A particular description of its improved make has been inserted by Bruns in *W. Arch. Journal*, &c. 4, p. 304. Dr. Bruns has published three cases in which it was successfully employed by Dupuytren. In the first of these cases, when the instrument had been applied, a complaint he supposed to exist, that it could not be displaced from it. The pain attacks, vomiting, diarrhoea, turned sanguine, and loss of appetite, which ensued, went away after the belly had been disordered; the constriction was then relaxed, and failed to produce loss and less inconvenience. On the 24th, very little of the faeces came out of the artificial anus, and after a short time, five natural evacuations took place. The blades of the instrument were now regularly closed, and on taking it out, a streak of sanguine was found between the blades; a proof that the speculum was directed. On the 26th, the patient's health was established. The cure was now unaccompanied with the pain of promoting contractions in the natural rectum; and the next day, the patient had a proper motion without any assistance, and a very satisfactory use of the force passed out of the artificial opening. This apparatus was now, severely covered with ointment; but as some high granulations were rising, the portion of ointment was sprinkled on these, and compresses and a bandage were applied. The use of clays was also daily continued, though the patient needed his food in the natural way. On discontinuing the external pressure, the quantity of discharge from the artificial opening diminished; and, therefore, on the first of October, the compresses were again applied, and kept on the part with a slight tension. The treatment ended in a perfect cure.

In another case, Dupuytren entered the lower sigmoidæ the water speaking with a history, and water forcing with his finger that both sides of the sigmoid were close to that opening, he applied the speculum. In the evening, the constriction was loosened, which was followed by seven more pains over the whole abdomen. They subsided, however, the following day. From the water speaking, a great deal of bloody mucus was discharged. The constriction was not increased. On the 24th day, the patient was attended in the night with pain and vomiting. The following night he was also very restless. Though the belly was not tense, it could not bear to be touched. On the 15th, and the 16th, the patient was nearly free from pain, and by means of clays, two natural motions were procured; and on the 17th, as the patient was dying, Dupuytren began to make pressure on the sigmoidæ opening. On the 18th, the blades of the speculum were touched with linear cauterization, and on the 20th, a compress supported by a spring frame was applied. The patient was kept constantly in the horizontal position; the food began to be voided the natural way regularly, and the evening commenced in the most favorable manner.

I think the generality of surgeons will agree with Dr. Rouget, that the foregoing treatment cannot be indiscriminately adapted to all descriptions of patients without danger. It should never be used long after the formation of an artificial anus, but must be delayed till the irritability and sensibility of the gut,

and especially of the sigmoidæ, to be destroyed by the effect of hot air and the pressure of the force. Nor should the trial ever be made, as it has been lately ascertained that sailors cannot resist being asked the cure. Brunsch's treatment has example in within the foregoing method could not have been practiced, in consequence of the morbidness of the lower portion of the bowel having been obliterated by the pressure of a large iron three inch diameter, which had been worn by the patient two years, and the projecting edge could not be removed. (See *Bruns's Journal*, &c. 4, p. 304.) Many other interesting observations on this new proposal may be gathered in the memoir by Dr. Brunsch, and in Dr. Rouget's treatise, the title of which is given in the list of works at the end of the present notice. In order not to enter the risk of an overstatement of the benefits the abdomen, the construction of the speculum should never be compared with that which have before the influence, inflammation has and time to be produced between the layers of which that part is composed.

In cases of artificial anus, the appearance of the sigmoidæ end of the bowel undergoes some change, in consequence of exposure to the air and the contact of extraneous bodies; it becomes thicker and less villous, but does not cease to exercise a peristaltic action of spasm; this is one of the principal reasons why it is so difficult to close the fistulous opening, even when the passages for the feces have been restored. This also serves as an indication as to the necessity of very gentle, and modified externally directed by the contact of the instrument. (See *Bruns's Journal*, &c. 4, p. 304.)

If after the destruction of the sigmoidæ, the peristaltic action of the sigmoidæ is lost, the external force was not to assist it being hindered by phlegm and other necessary means, no doubt could be entertained of the propriety of resorting to the plan of attempting to raise it by means of sutures and ligatures then applied with external, as is sometimes done by Dupuytren, or the Tassoul's procedure, as successfully described by Mr. C. P. Colles. (See *Med. and Physical Journal*, for June, 1834.) Dupuytren, for the purpose of making the sides of the fistula remain in contact, or raising them towards each other, occasionally applied an apparatus with the instrument consisting of two rods, which by means of a screw can be made to embrace the fistula. An engraving of it may be seen in *Bruns's Journal*, &c. 4, p. 304. For the closure of the fistula, Dupuytren also sometimes has recourse to the silver cylinder.

I shall conclude with the relation of an interesting case of artificial anus complicated with proptosis, as recorded by the friend Mr. Lawrence.

"I the complaint is, mentioned (in the) terminates in the formation of an artificial anus, we must endeavor to alleviate these distressing inconveniences which arise from the involuntary discharge of wind and feces through the new opening, by suppling the posture with an apparatus in which these may be retained as they pass off. An instrument of this kind, the construction of which appears very perfect, is described by Richter (*Lehrbuch der Wundheilkunde*, vol. 5, from the *Threat of a Synopsis of Jussieu*). The patient will be best enabled to resist any contrivance of this sort in the general circumstances of his own case. It has been found in some instances, that a compress elastic frame with a compress of lint under the pad, has been more serviceable than any complicated instrument (*Periodic Journal*, vol. 1, p. 181) in preventing the external part of the rectum from the artificial opening." (*Cyclopædia of Medical Art*, p. 220.)

"I know," says Mr. Lawrence, "a patient with an artificial anus, in whom the proctitis protrudes in the length of eight or ten inches, at the same time swelling from its surface. This is attended with pain, and discharges him to the down, to which position the intestine recedes. The patient has been discharged all the feces at the great sigmoidæ, and has enjoyed considerable health and strength during the time. His evacuations are generally first, but sometimes of the yellow coloration. Whenever he retains the stool after feeling an accumulation to void it, a quantity of clear mucous mucus like the white of an egg, amounting to about four ounces, is expelled from the anus; and this may occur twice or three times in the day."—(*ibid.*, p. 221.)

We hasten as much as possible the immediate preparatory measures, in order not to prolong unnecessarily the residence and cause agitation which the expectation of an operation, and maintenance of the slightest uneasiness, produces. These precautions are neglected by the English surgeons, at least by most of those whom I saw operate. They even carried them to the extreme, where, more commonly than in hospitals, we have to deal with post-humous individuals, who are easily alarmed, and whose extreme susceptibility it is of importance to soothe. It was in the very room, where the patient lay, of course under his eyes, that the table and all the necessary instruments for lithotomy were arranged, at an insertion which I saw done in London, during my stay at that capital, by a gentleman at the head of the profession.—(See *Paralysie de la vessie* de *Cherbourg* par le *Chirurgien* *Francçois*, p. 253.)

M. Roux, in his visit to London, had also the good reason to complain of the slovenly, objectionable practice of leaving the application of the lithotome, and the dressing of the wound, after a surgical operation, to mere nurses and students. I entirely coincide with him, that, as regards to the lithotomy, in particular, a surgeon is bound to extend his attention and vigilance to the bedside and the dressing of the patient, from the first to the last.

APPARATUS MINOR: APPARATUS MAJOR: APPARATUS ALIUS. Three ways of curing the stone.—(See *Lithotomy*.)

AQUA PITHI LAGUINIE. Blak. Taken of two pounds, water a gallon. Mix them with a vessel good for a quarter of an hour, and after the sea has subsided, let the liquid be strained, and kept in well-corked bottles. This liquor is often used in puerperal and other strumous with excellent success.—(See *Liquor*.)

ARRHENTI NITRAS. (Nitrate of silver, lunar caustic.) One of the best caustics. Its office in ulcerating indurated ulcers, and hospital strumous, from being the such, is well known to every surgeon.

Mr. Barker attributes the loss of the arrhenti caustic, on the first application in a chancre, before absorption can be supposed to have taken place. He directs the caustic to be scraped to a point, like a black lead pencil; so that when it is applied every part of the surface of the chancre may be touched with it; and he advises the repetition of the process till the last crust which is thrown off leaves the sore perfectly healthy.

This treatment, when the sore is very small, may sometimes be advantage at a distance of observing the change of the constitution being induced by absorption. In general, however, contents with the plan of the immediate use of mercury.

The important use of the arrhenti caustic, in the case of venereal disease, we shall have occasion to remark in various articles of this work; particularly *Chancra*, *ulcers of the prepuce of the Glans*; *Gonorrhoea*, *strumous of the*.

The arrhenti caustic is often used in the form of solution, in the proportion of a drachm of the caustic to six ounces of distilled water. In general, the application ought to be at first more or less diluted with distilled water. Cantharides glysters and water about the same and neighbouring parts of the face, being exempted of liquor, or cold air, or exposure, are often successfully treated by the arrhenti caustic, both in the solid and fluid state. The arrhenti caustic also may be used with certain cases which occur round the roots of the nails in the fingers and toes. The action is sometimes aided with a corn-char pencil; but is generally dropped with such tea of yolk of egg, till drying them on the part, and covering them with a plaster.

ARRHENTI is the chief ingredient in a secret remedy which has long possessed very great celebrity in London for the cure of cancer, and is now well known among surgeons by the name of Barker's caustic. This application consists of the lithotome, acris, the powder of cantharides, the following vulgar, and the less celebrated, in the proportion of an ounce of each, triturated and mixed with a drachm of the white oxide of arsenic and five scruples of sugar. The white is to be brought into a paste, formed into balls, and dried in the sun. When required fresh, these balls are beaten up with yolk of egg and spread upon a piece of pig's bladder. The use of the preparation is in destroy the

cancer, upon which the arsenic would have no effect, for it is so absorbed, that Venetian's caustic was employed for the dispersion of tumours as well as for the relief of ulcerated cancers. The application is to be made on the part twenty-four hours, at the end of which time the arsenic is to be dressed with any anti-inflammatory ointment. When arsenic was first recommended as an application for cancers, it used to be thought to be applied with opium. When Fischer's caustic is employed so as to form a scab over a sore, these are used, respectively, that just over the good, it is not by any specific effect of this medicinal preparation, but simply as a though in order to draw out the disease in any other manner. It is highly probable, also, that the ointments which have been thus prepared, have never been accompanied with the structure the materials of true scabs. With respect to cancers, most of the caustic sometimes extremely produces a degree of suppuration, which, however, rarely lasts for any considerable time; but there are many intractable ulcerations and abscesses which derive permanent benefit from the application, and are even completely cured by it. Some examples of cancer, abscesses about the roots of the nails, and repeated cancerous ulcers of the legs are of this description.

At Paris an arsenical paste is often used by Deland and other surgeons of that capital for cancerous ulcers of the penis and other malignant ulcers. It is composed of seventy grains of arsenic, twenty-two of sugar of lead, and eight of the white oxide of arsenic formed over paste with water at the time when it is to be employed. The paste and ingredients that composed the use of it (says Mr. Cruveilhier) cannot be equalled by the arsenical preparation with the best. (See *Journal of the Medical Society of Paris*, p. 45, 50, 1832.) From death may be accounted by the absorption of the poison, as appears from the two cases of cancer, the first of which is recorded by M. Roux in his *Mémoires de Médecine*. The day after the paste was applied, the patient complained of pain and severe vomiting, and in two days perished in convulsions, at the post mortem examination. The body was quickly into putrefaction. The internal coat of the stomach and a great part of the intestinal canal were inflamed and worked here and there with dark spots. Just before I visited Paris (adds Mr. Cruveilhier), I descended to London a woman who died under similar circumstances, and where the same morbid appearances were presented, &c.—(Op. cit.)

Jacquemont's applications to cancer were generally combinations of arsenic and sulphur. This formula was in some of yellow arsenic with half that quantity of Arsenical salt, and sometimes to which and precipitate. He also employed a compound of arsenic and a combination of this sulphur with crude mercury. The arsenical preparation which he used, was scraped and laid on the inside of the sore, the edges of which were touched with a combination of the mixture of iron and mixture of arsenic. In some instances we have seen the effects of the treatment were the correction of the fatal result, reduction of the appearance of the sore, and separation of the cancerous part.

In the *Pharmopoeia Chimica*, Jacquemont's arsenical caustic is directed to be made in the following manner. *℞. Arsenicum pulverisat. 5j. Arseni pulverisat. 7ij.* These are to be mixed together in a crucible. The application may be reduced to any degree of thickness by mixing with this pulverized substance a quantity of oil in the form of powder, which was also supposed to be superfluous in dissolving paste.

The powder of white oxide of arsenic, mixed with other substances, has sometimes been applied upon cancers and other venereal ulcers, but the practice is now abandoned by every judicious surgeon, on account of the violent pain resulting from it, and the not unfrequently fatal consequences of its absorption. Could I suppose, that a pain so rude and transient as to remove this miserable practice yet existed in the profession, I should not disposed to mention these remarks; but I am persuaded, that it is due society, at least, more judgment and knowledge every where prevail. The white oxide of arsenic, however, may be applied with more propriety in some cases, either in one of those already specified, or as a decoction, composed of eight grains of the oxide and the same quan-

loss of matter, enlargement of the pores, fatal petechia, &c. Above, or fact, may be considered space that cause of poison which induces entirely the same effects externally applied as well as when taken internally. The reason of this, in so far as those of other philosophers, demonstrates that for instance as the space is as less than and therefore when first to receive is as an external application to demand surface than what applied directly to the element. Another possibility of the other source also further to be said: according to Professor Weyler (Lectures on Physique Medical, in some cases, even while the machine is unresponsive from the operation of the power, for again fully applied are indicated, of a motion the general healthy pulse, and death occurs equally and unexpectedly; as sometimes or much occurring in the consequences of the surgical physicians. - Weyler.)

ARTERIOGRAPHY (Pron. *ar-teer-ee-oh-graf-ee*, as artery, and vial, to end.) The operation of opening an artery. For the purpose of taking away blood for the relief of disease. (See Medicine.)

ARTICLES. The practice by which a divided or principal artery is sealed is particularly considered under the word *ligatures*; while the general principles, which ought to be observed in the application of ligatures on the sleeping of blood, may be collected partly from the remarks contained in that part of the work, and partly from what is stated in the article *Ligation*, *Arteries*, and *Ligatures*. As the treatment of a bleeding patient depends of necessity, and the preservation of life in such a case depends upon proper measures being immediately taken, it must be left to the skill of the surgeon who is not competent to the treatment of wounded arteries, whether exposed by accident or to a surgical operation. An English book observes, as general practitioners, when called in case of several hemorrhages, is thrown into such embarrassment, as actually depends less on the power of rendering blood inanimate. Pale as a corpse, and trembling, he trembles the pit of blood; and, for the sake of appearing to do something, perhaps he applies spirit of wine or a very tight bandage, and cries out for further aid; while simple presence of the hand serves a useful part in the vicinity of the injury would point out the true condition, and a dangerous loss of blood. No part of surgery, in fact, is of higher importance than the treatment of wounded arteries; and it deserves, therefore, to be carefully studied by every practitioner, whether he move in the higher or the lower sphere of the profession. And as a proof of the necessity of correct judgment making themselves unacquainted with the subject, he notices the case of a barrister, who for the instrument with which he wounded against the lower part of his leg, whereby the posterior iliac artery was wounded. The blood gushed profusely, and the surgeon, who was sent for, applied a tourniquet at the posterior artery, and thus stopped the bleeding for a time; but, unfortunately, the tourniquet was kept so long on the limb, that the foot swelled and sloughed away. — *Edin. Med. and Surg. J.* 1822, 2d. vol. 1863. From the explanation, however, in the article *Hemorrhage*, it will be seen, and it is to be regretted from considerable arteries, undeviatingly to the ligature, as a means of preventing the further loss of blood; and it may be tied down as a final remedy, that such extremity of the wound would almost be tied as nearly as possible to the wound in its course. As Mr. Thompson has remarked, "the necessity of tying both ends of a wounded artery is evident from the fact, that the anastomosis in all parts of the body are so extensive, as to furnish a supply of blood which may pass through the lower extremity of a wounded vessel in a sufficient stream to produce a bleeding, not, in some instances, a fatal hemorrhage." — *The Doctor of Arteries*, &c. p. 461. This great observation is followed by a case, in which the artery from the lower end of a divided femoral artery passed the patient's death. Of course the inference is, that both extremities of the vessel ought to be tied down directly after the receipt of the wound. As regard to tying the trunk of an artery at a point the less where it passes increased with facility, we find the following notice its bleeding extremity, Mr. Thompson observes, the practice "was directly traced from a knowledge of the fact, that the ligature was given at a distance from the disease, and effected more of its cure." — *Edin. Med. and Surg. J.* 1822, 2d. vol. 1863.

"conforms with the condition of a flesh after such an operation, and the processes by which the cure of an aneurism is effected after the modern operation, afford a curious illustration of the efficacy and danger of this mode of treating a wounded artery; for it is now fully proved, that when an artery is torn, a structural blood-clot forms to plug the opening & to slow the ligature." (P. 421.) This total disregard of science is absurd, however, that a student doctor, in which all the upper end of a wounded artery is torn, and yet the patient recovers without hemorrhage from the lower orifice, which is closed by the natural processes.

In the Year 1844, in Richmond, I took up the Femoral artery, in the middle of the thigh, in a case in which the ligatured artery had given way, one day after the passage of a needle and thread through it. I saw only one single small ligature, which was applied with the permission of not detaching the artery from its natural connection. The hemorrhage was effectually stopped, and the wound healed in the most favorable manner. Here, no doubt, the infirmation in the lumen had obliterated the portion of the artery immediately below the point at which it had sloughed or abscessed, and those ligatures have been from the same cause some ligatures of lymph within the upper portion of the popliteal artery, contributing to the arrest of the operation. But, no doubt, it was the destruction of the capsule of the circulation by the ligature of the Femoral artery, which enabled nature to complete the obliteration of the wounded part of the vessel. Consequently, says Mr. Hodgson, when hemorrhages take place, a few days after the bleeding from a wounded artery has been stopped by compression, one extremity of the vessel will be pervious, while the other will have closed by the natural processes. Cases have even occurred, in which the upper end of the artery has been closed by the natural processes, while those processes failed in effecting the obliteration of the lower extremity of the vessel, from which a serious hemorrhage took place. (Hodgson, op. cit. §73; and Galtier, in New Med. and Phys. Journ. vol. 4, p. 177.) Indeed, in the example in which I took up the femoral artery, myself, it was impossible to say positively, whether the blood came from the part of the popliteal artery above, or below the point at which an incision was made into the lumen.

The principle, regarding the application of a ligature to each end of every large divided artery, is to be extended also to punctured arteries, one ligature being placed above and the other below the opening in the vessel.

From some observations in the article *Amsterdam*, p. 125, it will be seen, that when the impulse of the circulation has been lessened by the ligature of the main trunk of an artery, some distended vessels wound, the hemorrhage from the same remote portion of the vessel may sometimes be effectively restrained by pressure, which, previously to the stoppage of the great current of blood to the part had proved unavailing. This fact is worth remembering, in cases in which the arteries of the hand or foot are torn.

Hemorrhage is observed to be more frequent after the ligation of an artery for a wound, than for its anastomosis. In regard, Mr. Thompson very correctly, I think, refers the difference to the mechanical injury of the surrounding parts, and particularly of the veins and nerves, into the loose blood, and want of spasm and proper care after the accident. The principal anastomosing vessels are the same as described by ARNOLD.

Myers writes also about the "baleful" (p. 173),
"baleful" again, in the article *Arrogance*, the secondary
baleful, how to cut down by and the many of the
baleful article, I shall conclude the present subject
with a few instructions: how to cut up the articles of
the *Arrogance* and *Arrogance*, as declared by Myers, Mr. C.
and Mr. H. and *Arrogance*. Some instructions how
to cut is a case of uncuttable *Arrogance* and *Arrogance*
baleful.

In order to lay bare the radial artery at the upper end of the forearm, a finger is to be put on the insertion of the tendon of the biceps. A little below this point, as it is, about two inches and a half in length, is to be made in the integument, in the oblique direction, denoted by the lower edge of the supinator radii major. The supinator major is then to be divided, and the inner edge of the incision made nearly a little from the outer side of the arm: as the gap is between the muscle and the flexor carpi radialis.

male and the patient died of a sort of dysuria. When the trocar is short, the bladder, on extending and contracting itself, gradually quits the cannula, which becomes useless, and a necessity for the trocar without therefore may be planned. Whenever plans may be taken to direct the trocar obliquely downwards and backwards, serious consequences may be, in some degree, prevented by the axis of the bladder, and in the other of those accidents must always be prevented.

These preventives, however, may be effected by merely employing, instead of a straight trocar, a curved one, which will naturally take a certain direction. The improvement was suggested by John Jones, the inventor of the lithotomy needle, who also pointed to a curved trocar for this phenomenon in the bladder, very superior to the instrument of the same shape previously in use.

To this way of operating Mr. Sharp was partial, and Mr. Abernethy has recommended it under certain circumstances. The former remarks that it is an operation of no difficulty for the surgeon, and of little pain to the patient, as the trocar does in the bladder being at a distance from the parts affected. It is equally applicable, whether the bladder be at the neck or the prostate gland; and when there are strictures, the use of trocars may be continued, while the cannula remains in the bladder. — (*Critical Inquiry*, p. 175, col. 4.)

Some writers recommend making an incision about two inches long through the skin at a little way above the pubes, and then introducing a trocar into the bladder. Others deem this preliminary incision quite useless, alleging that the operation may be performed with equal safety and benefit to the patient by puncturing at once the skin, the loose skin, and the bladder. When the trocar has been introduced, the stricture may be withdrawn, and the cannula kept in its position by a thread passed through ring holes made, with which it should be constructed, that extend round the body. The style of the cannula should be stopped up with a little plug, so as to keep the urine from driving away involuntarily, and taken out as often as may be necessary. — (*Encyclopædia Méthodique*, part. Chirurg. art. Paracentèse de la Vessie.)

The trocar should be introduced in a direction obliquely downwards and backwards. For as the correspondence with the axis of the bladder, the instrument will be less likely to injure the opposite side of that organ.

Nearly all writers advise the puncture to be made as high as is safe, and a little above the pubes. The reasons for so doing are the following: "If the puncture be made close to the os pubis, the bladder in that part, often rising with an almost perpendicular shape, leaves a chasm between it and the abdominal tegument, as, in speak more strictly, a certain depth of membrane cellularis only, so that if the trocar penetrates but a little way, it possibly may not enter into the bladder. If it penetrates considerably, it may pass through the bladder into the ureters, and not in the operation itself, some days afterwards, when by the course of the urine and confinement the patient is more troubled. For the abdominal muscles, striking and falling, by compressing the extremity of the cannula to press against the lower part of the bladder, and in a small way to make a passage into the ureters." — (*Sharp*, in *Critical Inquiry*, p. 175.) "Though the puncture here advised seems at first as formidable as they are numerous, both the danger of wounding the peritoneum from an operation so plunging is a trifle at the above distance from the pubes." Certain it is, punctures would be necessary to be induced by such position, than by introducing the instrument immediately above the pubes. Richman decidedly condemns the plan, principally because the higher the puncture is made, the more apt the bladder will be to pass the cannula as pressure being discharged. — (*New Voyage*, chap. 5, p. 175, col. 5.) In Dugue's works by Richman, the puncture is also advised to be made immediately above the pubes. — (*Y. K.* p. 318.) Some of Mr. Sharp's opinions are concerned in taking care to pass the trocar into the bladder in the part of the ureters, and expressing one which is somewhat curious, as Harvey, John Jones, Sommer, &c. have advised. Mr. Sharp confesses the danger of using too long a cannula, by mentioning an accident which occurred in his own practice. "Though he introduced the instrument more than an inch and a half above the os pubis, yet having pushed it full two inches and a half below the surface of the skin, the extremity is not at

seven days introduced itself into the bladder." — (*Critical Inquiry*, p. 175.) The instrument, with its cutting edge, should be made in such form, according as the ureter is fat or otherwise; but the ordinary height should be above two inches and a half. The operation should be uniform, and from the surface of a cyst, about eight inches in diameter. — (*Y. K.* col. 4, p. 318, par. Richman, l. 2, p. 317.)

A catheter left in the bladder longer than six days may gather such an irritation from the urine as to be only to render the operation of it painful, but very unprofitable. Surgeons, therefore, should never leave the cannula in the bladder after a fortnight, and it is not to be kept introduced so long. Mr. Sharp advises a second one to be introduced, made with as much care as the first. — (*Critical Inquiry*, p. 175.)

Mr. Abernethy, however, has reported one instance in which a catheter was kept in for a long time without inconvenience. — (*Medical Annals for the Year 1800*, 2d. ed. p. 39.) I have seen this report, and very often examples of the same kept up, mentioned by Dr. Jones. — (*Journal*, vol. 2, p. 416.)

Mr. Abernethy makes his incision between the pyramides scapulae, passes his finger along the upper part of the sympathetic gland, so as to touch the duct of the bladder, and introduces a common trocar at the middle end in a direction obliquely downwards. On withdrawing the style, he passes a middle-sized common elastic catheter through the orifice into the bladder. The cannula is withdrawn, and the catheter left into the urine passing through the ureters. After a week, as the instrument begins to be rejected by the urine, it is taken out, and a new one introduced. — (*Medical Observations*, 1804.) It might be objected to this plan of employing a hollow needle, that as it is smaller than the wound, the urine is not kept from passing between the instrument and parts over which it is introduced, as well as through the hole itself. The response in Mr. Abernethy's case, and though as true as that instance got into the cellular membrane, it might sometimes be so, because it is so often after inflammation has taken place, that the orifices of the cellular substance are closed with coagulating lymph. After a day or two, however, the contents of the tract would be withdrawn and the hollow tube employed, which would be less likely than the other one to come disengaged of the posterior part of the bladder.

The following is one of Mr. E. Hæver's comments: "When the puncture is made directly upon the cystitis which encloses the trocar is not to be fixed, all the surrounding parts have been rendered by inflammation, so as to prevent the urine in its passage out from penetrating itself into the neighbouring parts. For where the urine edges infiltration takes place. Any advantage, therefore, which may arise from a more flexible instrument remaining in the bladder, is more than counterbalanced by its not fitting snugly the aperture through the coats of the bladder, and allowing the urine to escape into the cellular substance." — (*Transactions of a Soc. for Med. and Chir. Amsterdam*, vol. 3.)

There is much truth in the following passage. The abdomen is relaxed; the preliminary incision, which prepares for the introduction of the trocar, sometimes passes through several inches of an old cellular membrane; the incision must be made as prepared as they fight; the cannula is no longer edged with steel, it is displaced, in some degree, by the contraction of the bladder, which, often expanded, remains under the pubes. The cannula stands so obliquely, that the urine never flows with ease, but by pressure out into the ureters, and by being rejected among the cellular substance, it causes the urine to remain; the wound by its proximity to the inflamed peritoneum soon becomes, and thus, notwithstanding the frequent trial produced by the movement of the bladder, the point does on the third or fourth day. — (*Johns on a Synopsis of Surgery*, vol. 2, p. 171.)

That this operation is infinitely better than that of making the puncture in the peritoneum, is undoubted. There are even now some good surgeons, who wish to prefer it to the method of exposing the bladder from the ureters. In the *Obstetric Characteristics* of 1801, l. 2, p. 224, it has, however, the advantage; and at p. 212 of the same book, a high necessity is shown in it in the following terms: "This operation is such. The little thickness of the parts which are to be

wounded, renders a quick and intelligibly painful. The patient has learned to be a soldier. The patient is neither frightened nor injured, with the pressure in which he is yet. It is almost impossible to force the bladder except at the extremely constrained. There is no risk of poisoning the cavity of the abdomen. A urinary passage, that has the bladder in its immediate contact with the wall of the abdomen, and that when this is to be distended with urine, it stretches the peritoneum upwards and backwards, rather than downwards. It is, of course, and thus carries the point of the incision lower down and more distant from the cavity of the abdomen. The patient may easily be so made or otherwise, as to be discharged at the time required by the doctor. There are here but three or four vessels of which the cavity is to be cut. No difficulty is experienced in doing the operation, and the pressure of the instrument does not hinder the patient from sitting, standing up, or even walking about in the hospital. When the patient is left in the hospital, he is never out of the hands of the nurse, who cannot possibly get it. Lastly, the wound heals with more facility, than that made in any other method.

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This operation (according to Sir Astley Cooper) is very easily performed; it is not liable to the objections which were formerly made to it, and it is an immense gain. In the female it is the only proper mode in cases of retention of urine from retroversion, and from an obstruction of the os uteri, by prolapsus of the ovary; for (says he) opening the bladder through the vagina is a very painful and dangerous operation, as the urine afterward bubbles up that passage, where it otherwise has the highest degree of excitation, attended with dreadful suffering, and constitutional irritation. "It is an operation which ought never to be performed." —*See Cooper, vol. 2, p. 410.*

According to my own judgment, the plan which is about to be described is the noble and best, when the circumstances of the case afford a chance: and I think, that it would be for the benefit of the afflicted if the patients above the pulpit were only performed in cases in which the enormous weight of the prostate gland and disease, in the rectum, prevents it from being safely done from the perineum.

3. Purchases from the Section

This method is more generally applicable than either of the two plans above related. It is not, like the previous two, the permanent, liable to the objection; that the wound is made in a recessed or inflexed part which is subject to necrotic gangrene. Nor is it like the previous plans, the plan, attended with a chance of the same effecting itself in the cellular membrane. It has also the advantage of exposing the bladder immediately. The puncture is made judiciously far from the neck of the bladder not to expose any inflammation existing around the neck; and the operation is easily attended with little pain, since there is no skin but remains to be wounded, namely the parts of the fibrous and muscular coat, at a point where these organs do not adhere with each other. In cases of enlarged prostate gland and of disease of the rectum, however, some other method should be chosen, though I am of opinion, that in the first of these cases, puncturing the bladder at all can seldom be absolutely necessary, as the catheter may almost always be introduced by a surgeon who understands the nature of the disease and its alterations of the course of the prostate.

Worked in the palaeontological Department for 1770, at a time of local flooding of large dams structures, where the bodies were essentially powdered from the surface. The plan was suggested by Mr. Haidar, who did the specimen by his feeling the ladder knowledge, present in the region where the finger was in the hand.

The patient was placed in the same position as that for lithotomy; a tensor was passed along the finger into the urethra, and pushed into the bladder and most proximal part of the swelling, in the direction of the apex of the bladder. A straight catheter was then introduced through the urethra, just the finger by continuing through just the tube, which was then snug, and as soon as the water flow was changed the patient was again operated. During this time the pressure of the bladder remained the same and with a flow of water continued. Then the opening made by the instrument seemed to change, and the water flowed in a well defined stream again. The tensor came away in the morning five days after which a poultice was applied with the aid of a tensor, which had been passed through the opening into the bladder and which was used all of the time in the case until cured.

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In order to sustain the friendship and other interrelationships mandating the provision of the medicine, Fierstein emphasized that it would be better to employ a little bit of a flexible substance, and some of the students approve the plan of passing a flexible valve through the liver and into the bladder, and withdrawing the liver treatment.

In the first volume of the *Annals of the Medical Society of London* two cases are related, in which, after taking the tincture from the rectum, the cannula was immediately withdrawn without any bad effect; and a similar fact is recorded in the *Medical Communication*, vol. 1.

A sword, the, of sufficient length, is the best for performing the operation, and was recommended by Ponsard. As the incision with a lancet-punt may cut blood-vessels which would bleed freely, some authors express their preference to one made with a straighter point. (*Monro*, p. 218.) It should be introduced into the junction made by the distended glans, a little beyond the prostate gland, exactly in the centre of the form of the ureters; but not imprudently far up the ureter, lest the perforation be injured. For some useful remarks on this point, the practitioner is referred to Mr. Carus, who has very properly collected in the very long paper to which the portion of penmanship is referred, over the article described. (*Ann. of the Med. Observ.*, &c., v. 178, no. 100, 1811.)

The towel should be introduced in any direction of the side of the bladder, or merely in an imaginary line drawn from the spot to be perforated to the middle point between the navel and the external os.

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weight, and she was immediately seated with a pain in the small of her back, and a total cessation of urine. In April, 1776, she applied to Mr. Werser, who stated that she had never been able to pass the contents of the urinary bladder, and that she was in continual pain, and had daily been much weakened by having several times lost considerable quantities of blood, occasioned by the force made use of in introducing the instrument into the bladder.

Mr. Werser, upon examining the parts with his finger, which he had great difficulty in introducing into the vagina, discovered a considerable tumour, which seemed to be of a fleshy substance, and took its rise from the lower part of the bladder near its neck. When the patient strained to make water, the bladder was distended, the tumour protruded a little way out of the vagina, and then, but upon ceasing to strain it gradually returned.

A surgeon having been given two days before the operation, and the patient excited by means of an emollient regimen, Mr. Werser directed the patient to strain so as to make the swelling project. He then inserted it from within into the bladder by passing a ligature through it, and tied it round it as far as it protruded. The latter object was found impracticable in consequence of the size of the tumour. Seeing this, Mr. Werser directed the patient to compress the right side by cutting a deep furrow about half way across the neck of the bladder, which, by pulling the swelling downwards, he was enabled to do, in fact, which was very hard.

For three days after the operation, a great deal of pain was felt in the abdomen. On the sixth day the tumour dropped off. From the first day the urine came away without difficulty, and the patient got quite well. The tumour resembled a turkey's egg in shape and size. (See Werser's Cases in Surgery, 4th ed. p. 281.)

Perhaps in this case the ligature was more pressure to rupture it away, even though its force was large; or had the knife been used, there would have been some doubt of the bladder becoming diseased with blood.

For an account of other instances of the bladder, I refer the reader to *A Practical Treatise on the most important Complaints affecting the Urinary and Digestive of Urine*, by J. Huxley, 4th ed. Lond. 1822.

A case in which large quantities of hair, mixed with calcareous matter, were first taken to have extruded from the bladder through the urethra, occurred. The disease produced severe pain in making water, and other complaints resembling those of stone. At length, Delpech, supposing that the hairs were formed in some cyst, communicating with the bladder, determined to divide the duct by operation. Previously to dissection, every preparation which could be taken from the tumour was exhausted; and by gradual compression, as large as an egg, was felt in the part where the bladder and vagina nearly touch. With the lithotomy cyst, the tumour was found in the direction towards the symphysis pubis, and being taken out to divide the vagina, the tumour was found to be the bladder, and, as the bladder is situated at the side of a patient's leg, it was felt, which was easily extracted. A large mass of hair and calcareous matter was also removed, projecting at the neck, and right point of the bladder from its opening, the edges of which were of hair, and contained that the calcareous substance appeared the purpus (cysts) for their attraction. After thus dividing the aperture of the cyst, Delpech passed his finger into it, and a large quantity of hair was pushed out of the mouth. It was also removed, and the dividing found a considerable prominence within the bladder, and that it had a cystic neck which could be cut. This was afterwards done with a piece of silver wire, covered round the part by means of the ring at the end of the catheter. Five days afterwards, what had been first supposed to be a cyst, and in the opinion of Delpech was very firm and without any cyst. It is short, the ligature had only divided the cyst of the cyst, and the bladder would now be a large opening, and though from a cyst, corresponding to the opening, but because the bladder is situated. The cyst was found as a part of the bladder, and Delpech considered that the new change of cyst would result from lifting an injection into from a height of six feet, through a pipe like the eye, so as to wash it out with care.

Open. This was created pain in the abdomen, and fever, so that it could not be continued; but, after the discharge of more hair and calcareous matter, and a substance as large as a hen's egg, which was covered by calcareous matter, a more thick, the patient got well. This substance is said to have been the product of the cyst, and the way in which it lay extended to the mouth. The case is highly interesting to the practitioner. (Delpech, *Chirurgie Clinique*, t. 2, p. 521, et seq.)

Bladder, Fibrous of. See Fibrous.

Bladder, Fibrous of the Bladder. The instances in which urinary bladder has been described from the bladder are very numerous. Many cases of this kind are referred to by *Boyle's Fibrous of the Bladder*, Anatomical, 4th ed. p. 227-242. A few years ago, an interesting case was recorded by Mr. Lawrence. (See *Med. Chir. Trans.*, v. 2, p. 262, et seq.)

*Bladder, Fibrous of. Numerous examples in which this deviation from the natural structure has occurred are referred to by medical writers. The following, however, which, as far as I know, contains the most ample information on the subject, is a dissertation (1849) dissertation, entitled "De Fibrous Fibrous of the Bladder," by Dr. Ross, late professor in Brunswick, and a paper called "An attempt towards a systematical account of the appearances associated with the malformation of the Urinary Bladder, in which the writers, instead of attempting to a proper manner, only interesting in the subject of the disease," by A. Pringle, in the *Ann. Med. and Surg.*, 1849, vol. 1. In this last dissertation, may be seen references to all the most recent cases on record, both male and female. (See also *Fibrous of the Bladder*, *Practical Medicine*, vol. 1, p. 120, 121, 122, 123, 124, 125.)*

Bladder, Fibrous of. See Fibrous of the Bladder. Many cases of rupture of the bladder from stones or from other causes, followed by fatal extravasation of urine in the abdomen. Two such instances have been recently detailed by Dr. Pouch. (See *Arch. Med. Chirurg.*, vol. 2, p. 311, et seq. 1855. Also in *Medicinal and Med. Communications*, vol. 2, p. 384, 385.)

Bladder, Fibrous of. See Fibrous of the Bladder. By this operation, a solution of the taking away of blood for the relief of haemorrhage. Bleeding is called general, when procured with a view of lessening the whole mass of circulating blood; and local, when performed in the vicinity of the disease, for the express purpose of lessening the quantity of blood in a particular part.

General Blood-letting is performed with a lancet, and is subdivided into two kinds; viz. the opening of a vein, termed phlebotomy, or venesection; and the opening of the temporal artery, or use of its branches, termed arteriotomy.

Typical Blood-letting is performed, either by means of a tapping glass and a siphon, or, instead, or by dividing the vessels, and dividing the vessels with a lancet, as is frequently done in cases of epilepsy.

In the Northern and Western States, bleeding is very generally performed by the tapping lancet, while in the North and East, the blood lancet is almost universally in use. The choice of instruments must of course in every case be left with the operator, although, as a matter of convenience, it may sometimes be proper to stick in this respect to the wishes of a sensitive patient, and hence many surgeons have both at hand, whether they voluntarily prefer one or the other. The use of the blood lancet is thought by some to require less skill than the other, and hence they whose interest and common opinion is to use it; but considering their own skill in the use of the spring lancet, they give this the preference in their own hands. From what I have seen, however, in the South, where the spring lancet is in almost every body's hands, and in the North, where it is seldom seen or used at all, I incline to be of opinion that, although from long habit I employ the spring lancet myself exclusively, when the practice of the patient does not object. In the hands of an ignorant or awkward phlebotomist, I never have the blood lancet to be a more dangerous instrument. There is first the risk of transferring the vein, and then the hazard of wounding the artery beneath it, both the one and the other being greater than with the spring lancet. This latter accident of wounding the artery in the groin or wrist is the median hæmorrhage, is known to be a very rare occurrence in these parts, the

In the first, the blade of one finger, bent at a moderate acute angle, between the thumb and the index, and, drawing the hand over the other three fingers, is so introduced, that the blade is at a right angle with the vessel, and the thumb is at the point of the instrument. Then bringing up the front edge so as to make as firm a pressure as is tolerable in the vein. The operation is then done by drawing the left hand, with which the thumb is pressed, and allows the blood to escape freely, till the amount desired is obtained. The arm is then to be kept in the same position while the blood is escaping, but the other should keep over the surface of the vein, keep the blood from getting dry, and make it coagulate freely and become a solid mass.

When the blood stops, these hands, more pressing direct the patient to move his fingers, so that something round and solid is in his hand. Thus puts the muscles of the arm into action, and the pressure which they then make on the vein makes the blood coagulate most freely through these vessels.

The great quantity of blood being discharged, the flow is to be stopped. The flow of blood now gradually ceases; though sometimes, when the artery is large and the resistance very vigorous, it still continues. In this circumstance, the operator may immediately stop the bleeding, by placing the thumb of his left hand firmly on the vessel, a little below the puncture.

The blood is next to be all wiped off the arm, the sides of the wound placed in contact, and the coagulums applied and secured with a drier, put round the elbow in the form of a figure of 8, and regularly changing just over the coagulums.

The patient should be allowed not to move his arm until the fillet is removed, which may be done after twenty-four hours.

In order to open the external jugular vein, the patient's head is to be laid on one side, and properly supported. Then the operator is to turn open the lower part of the vein with his thumb, so as to make the part above swell, and then the lower is to be pushed at once into the vein, with the canula already armed.

There is commonly no difficulty in stopping the bleeding, after the pressure is removed. Some practitioners divide the instrument with a scalpel, before the vein itself is opened; but this is quite unnecessary. In this country, the fashion of opening the jugular vein has considerably declined. In fact, the operation is now unnecessary, and less certain of success, than elsewhere in the arm; while the principle which recommended the practice is the old saw, namely, that of more effectively discharging, in this manner, blood from the sinuses of the brain, it is erroneous; for it is only the external jugular vein that can be safely opened, and the blood not remove the blood from the sinuses of the head.

Bleeding is in the feet as executed on the same principle as in other parts; but as the blood from the veins in the situation generally does not flow with much energy, it is necessary to immerse the feet in warm water to promote the bleeding.

INTERMITTENT.

The great source of any vein from which blood is withdrawn is, in fact, the trunk and branches of the blood vessel, which in such a situation, that they may easily be compressed against the adjacent bones, and the bleeding stopped. When the vessel which the operator wishes to open lies very near the surface, it may be compressed in drawing, or even by its pressure it may be moved at will with a finger. In many instances it is so deeply situated, that a forceps is necessary in the first place to make a cut in the skin, and then to elevate the vessel.

The blood, however, will not flow very freely, and may have to be continued with a syringe and siphon. As a very low vein, the blood turns itself from side to side, and so it is that it is necessary. When this happens, the coagulums formed, it is recommended to divide the vessel externally across, where it is possible, the process of ligation is done at the end of the vessel, sometimes at a distance below, where it will be traced by the arteries exposed in a dissection. (See Anatomy.) Careful care is to be taken of dividing the vessel and peritoneum.—*Edin. & Camb. Obs. & J. & F. 1821.*

THICKENED SKIN.—PNEUM.

This is done by means of a scarificator, that is a glass shaped somewhat like a bell. The scarificator is an instrument containing a number of lancets, sometimes as many as twenty, which are so contrived that when the instrument is applied to any part of the surface of the body, and a spring is pressed, they suddenly start out and make the necessary punctures. The instrument is so constructed, that the depth to which the lancets penetrate may be made greater or less, at the option of the practitioner. As only small vessels can be thus opened, a very considerable quantity of blood would be discharged, were not some means taken to promote the evacuation. This is commonly done with a sucking glass, the air within the cavity of which is removed by the force of a little long sagging spout of wire, and furnished with a thick wick. This glass is preferable to that of sucking on the top of a glass tipped at the end, and put in the cavity of the leg, as a chimney expedient, adding unnecessarily to the suffering of the patient by confining the skin, doing harm also by carrying the air more than necessary under the glass, in consequence of which the edges of the cup compress the adjacent vessels so much so as to obstruct the influx of blood. The larger the glass, if properly calculated, the less pain does the patient suffer, and the more freely does the blood flow.—(See *Magendie's Treatise on the Art of Dissecting*, p. 62—63, 1826, Lond. 1821.) When the mouth of the glass is placed only the skin, and the scarified area is it becomes condensed as it heats, the glass is forced down to the skin, and a considerable vacuum takes place.

This professor of the said art remarks, that when the operation is about to be done, a basin of warm water, a piece of fine paper, and a lighted candle should be provided. As many of the sucking-glasses as may be judged necessary are to be put in the basin. If sufficient air freely enters of blood too to be taken away, the glasses, if it were adapted to the surface to which they are to be applied, will possibly be required. Each glass must be held for an instant over the place of the operation, and immediately placed upon the skin. Upon the quickness with which this is done, the success and efficacy of the operation will depend. If dry cannot be very injured, the glasses may be allowed to remain on the skin for a few moments, and be raised five or six times, with a little variation of their position, in order to prevent the skin from being hurt by their pressure. If the intention be to scarify and take away blood, the glass should not to remain more than a minute, when the scarificator is to be successively applied; for by the quickness with which the application of the scarificator succeeds the removal of the glass, the patient is saved a degree of pain, which he would otherwise suffer from the making of the punctures. When the glasses are so held as to be in danger of falling off, or the blood is coagulated in them, they should be removed, changed, and applied again. For the sake of success, care should be taken to immerse the end under the upper part of the glass, and remove it so as to keep the bottom downwards, the scarifications being at the same time wiped with a sponge wet in warm water. The glasses also, previously to each application, should be rinsed in warm water, but not dried. For those, and many other kind directions, see *Magendie's Treatise*, p. 64, &c.

There have been made of cylinders calculated for evacuating the air from sucking-glasses; but the glass is not found so convenient as that above described.

A cotton pledget, or bit of rag, is usually applied as a dressing to the punctures made with a scarificator. If a little ointment be not found, Mr. Magendie prefers the application of argemone water or spirits of wine, as it immediately stops the oozing of blood, and prevents subsequent itching.—(P. 63.)

TAPE.

Leeches are often preferable to cupping, when it is needed with very irritable skin, or very sensitive, under particular circumstances, can bear, especially when the topical bleeding is not so frequently repeated, and they can be used in cases in which a wound not so safe or convenient as cupping is required.

Formerly medical leeches were very abundant in England, but owing to their now being in great expense, and to the drawing and absorption of much blood, it is necessary to import large supplies from the

lines up and down the arm, and upon pressing in the course of this part, its degree is increased. On examining the arm attentively, indurated abscesses may be plainly felt, lying in the tumour at the side of the deeper muscle.

The pain and swelling often extend to the axilla, where the glands also sometimes enlarge. Cord-like abscesses, evidently abscesses, may sometimes be felt, and only leaving from the parietes to the axilla in the middle of the arm, but also from this latter situation up to the axillary glands, and from the wound in the arm down to the enlarged glands at the mid-space between the elbow and wrist, over the flexor tendons of the hand.

The enlarged glands often proceed to suppuration, and the patient suffers terrible symptoms. It may be supposed that the foregoing consequences arise from the blood being withdrawn, and from the absorption of the current matter; but the frequent descent of the disease to the inferior abscesses militates against this supposition.

When the abscesses become inflamed, they quickly supersede the effects on the surrounding cellular membrane. These vessels, when indurated, appear like small cords; perhaps of one-sixth of an inch in diameter—the substance causing the slender sides of the vessels, suddenly increased in bulk, but an induration of the surrounding cellular substance.

The inflammation of the abscesses, in consequence of blood being withdrawn from two causes:—the absorption of circulating matter, and the other, the effect of the same irritation on the divided tissue. When vascular matter is taken up by the absorbents, it is generally conveyed to the real absorbent gland, where its progress being retarded, its circulating qualities give rise to inflammation, heat, frequency, an evident distension of the vessel through which it has passed can be distinguished.

When inflammation of the abscesses happens, in consequence of attrition, this part of the vessel nearest the irritating cause generally suffers most, while the glands, being usually drained, and not so much inflamed.

The treatment of the preceding case consists in keeping the arm perfectly quiet in a sling, drawing the parietes of the vein with any suitable adre, covering the section of the inflamed lymphatics with lint wet with the nitrate lotion, and giving some gently purging medicines.

When the glandular swellings suppurate, poultices should be applied, and if the matter does not soon spontaneously make its way outwardly, the surgeon may open the abscess.—(See *Mr. Hunter's Reports on this subject*.)

4. Inflammation of the Vein.

When the vessel does not unite, the vein itself is very likely to inflame. This affection will vary in its degree, extent, and progress. One degree of inflammation may only cause a slight thickening of the vessel tube, and an adhesion of its sides. Abscesses, more or less extensive, may result from an inflammation of greater violence, and the matter may sometimes become blended with the circulating fluids, and produce dangerous consequences; or the matter may be quite absorbed, and make its way to the surface. When the vein is extensively inflamed, a great deal of suppuration does not always ensue, not merely from the effluence which inflammation usually produces, but also from the attrition continued along the membrane being of the vein towards the heart. If, however, the vessel inflammation should fortunately produce an adhesion of the sides of the vein in such order as some little distance from the wounded part, this adhesion will form a boundary to the inflammation, and prevent its spreading farther. The effect of the adhesion is inflammation, in preventing the extension of inflammation along the venous surface, true originally explained by Mr. Hunter. In one case Mr. Hunter applied a compress to the inflamed vein, above the wounded part, and he thought that he had tried succeeded in producing an adhesion, as the inflammation was prevented from spreading further. When the inflammation does not continue rapidly in both directions, but becomes a ring the degree of the vein, its extension in the other direction is probably prevented by the adhesion of the sides of the vein to each other.—(See *Obs.*

on the inflammation of the internal coats of Veins, in *Thomson's A Treatise on the Improvement of Med. and Chir. Knowledge*, vol. I, p. 18, 19.) More information on this subject will be found under the head of Veins.

Mr. Abernethy sometimes has having seen only three cases in which an inflammation of the vein succeeded amputation. In neither of these did the vein suppurate. In one about three inches of the vessel tube inflamed, both above and below the parietes. The inflammations over the vessel were very much swollen, red, and painful, and there was a good deal of fever, with a rapid pulse and limited tongue. The vein did not swell when compressed above the diseased part. In another instance, the inflammation of the vein did not extend towards the heart, but only downwards, in which direction it extended as far as the wrist.

The treatment is to lessen the inflammation of the vein by the same means which other inflammations require, and to keep the attrition from spreading along the contiguous surface of the vessel towards the heart, by placing a compress over the vein a little way above the parietes, in order to make the opposite sides of the vessel adhere together.

Mr. Abernethy describes a case possible in which the vein was very much enlarged, and a total division of the vessel being made, not nearly so elastic the extension of the vessel was, but it present the pain from burning arising with the contraction. Were such a proceeding desired, I think Mr. Hunter's method of stitching the vessel would be best. However, I have never heard of any case in which the practice has been adopted. As for the effects of tying the vein above the diseased part of it, the severe effects frequently following this method treat, as Mr. Hunter has remarked me, render it less eligible than an operation. In the case of an inflamed vein, Dr. Carpman states that nothing is so efficacious as blisters, a practice said to have been first suggested by Mr. Physick.—(See *Effect of an Inflammation of the vein from Fracture*, in *Philadelphia Journal*, Feb. 1811.) I was lately favoured by Mr. Harshby with a view of the state of the parts in a case where a lady had died after an inflammation of the vein of the arm, brought on by venesection: they were considerably thickened, and in some cases quite solid and imperious.—(See *Veins*.)

5. Inflammation of the Paries of the Veins, or slight inflammation of the cellular membrane.

Separation, in consequence of the inflammation arising from the wound of the artery in bleeding, the arm becomes very painful, and soon hardly to move. The parietes often remain thickened, but without much inflammation of the surrounding integuments. The forearm and fingers cannot be extended without great pain. The integuments are sometimes affected with a kind of erysipelas; being not very painful when slightly touched, but when forcibly compressed, so as to affect the inferior parts, the patient suffers a good deal. The pain frequently extends towards the axilla and shoulder; an swelling, however, being powerful in either direction. These symptoms are attended with considerable fever. After about a week, a small superficial collection of matter sometimes takes place a little below the internal condyle; this being opened, a very little pus is discharged, and there is scarcely any diminution of the swelling of pain. Perhaps, after a few days more, a fluctuation of matter is distinguished below the external condyle; and this abscess being opened, a great deal of matter issues from the wound, the swelling greatly subsides, and the patient's future sufferings are comparatively small.

The last opening, however, is often inadequate to the completed discharge of the matter, which is sometimes originally formed beneath the fascia, in the centre of the arm, and its pointing in the upper part of the arm depends on the thickness of the fascia in this situation. The collection of pus descends under the lower part of the detached fascia, and a depending opening for its discharge becomes necessary. This being made, the patient soon gets well.

In these cases the vein is not inflamed; but sometimes the glands of the armpit and pain above the elbow swell. The integuments are not much affected, and the patient complains of a tightness of the forearm. Matter does not always form, and the pliability of the arm after a good while gradually resumes again.

Mr. Wilson relates a case which was followed by a

published what had been communicated to him upon this subject. In the year 1554, Américo Vesputio published a treatise, in which he refers to several witnesses to prove, that the empirical practitioners above alluded to, had learned from him the use of leeches, while, on the other hand, he manifestly avers, that he himself was indebted to Aesculapius, or *Asclepiades*, for a knowledge of those instruments. In 1559, however, Alph. Ferris of Naples, endeavored to show, that his acquaintance with the utility of leeches resulted on the back in 1548, and, of course, that he had anticipated Linnæus, and probably even Aesculapius. But, instead of representing himself as the original inventor of leeches, he manifestly, that they were known to Aesculapius at least 1500 years, if not, carries back the invention to the sixth century. A. Ferris also makes various modes of expressing the state of the system, and, among other things, exhibits three kinds of double lead seal of different sizes. Eschylus's ornaments or seal were round, according to the opinion, and language, were also not used by Pothorius in 1515, and afterwards by A. Ferris. The oldest leeches, which were seals of copper or silver, seemed with some and exclusive patients, were in time succeeded by those composed of brass united with wax. This system was made with the view of letting them have a longer continuation; an experiment which was first tried by Pothorius at Aquapendente. — (M. Chr. 1617.)

In the middle of the 19th century, the manner of thinking and seeing images was well known to Rodin. As a sculptor from the Romanticism era, he

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During the course of the other writers, highlighted the efficiency of their designs to the corresponding trend in economic theory. In the economy, the theory of the firm, it was mainly used in the process of production, even when the affected part, and the other, which is that it is possible to have different competitive responses, which is not the case in the theory of the firm, it is possible that it does not have any particular efficiency in the theory of the firm, but by means of some of the other writers, especially the mechanical form.

As the tendency as well as the discussed parts are exposed to the efforts of insects made always active insects, modern surgeons always prefer such an operation made of a sterile and inflexible composition.

Punch recommended bougie of silver, which may be easily introduced into the urethra, even when it is greatly contracted, their size being small. Their introduction, first, and tolerable by insertion. It is almost to insert, however, that it sometimes is applied to the stricture, and gives great pain on being withdrawn. Fortunately, catheter bougies were afterwards used, and the stricture gave a valuable material, on which I did not dwell.

The invention of elastic dentures was rather haphazardly formed, a serendipity at that time in the year 1779 presented some instruments of this kind to the Academy of Surgery, which served as the origin of the claims made by Professor Perrot of Strasbourg, the discoverer. — *Opus Dentale* M.D. 1784.

For the country of England, where there is no thought to be very desirable, as it seems known and inevitable. Mr. Williams, in his *Philosophy of Language*, is inclined to think that the art of doing things (instrumental) is the only one that is really valuable. He says: "The only thing that is really valuable is the art of doing things. The only thing that is really valuable is the art of doing things. The only thing that is really valuable is the art of doing things." This is a very interesting statement, and it is one that is worth considering. It is a statement that is worth considering, and it is one that is worth considering.

I find it positively asserted, however, in a number of great papers, that the idea of making printing the sole office really important in a country, as a national need is nothing more than based on time for a considerable time, and used as a vehicle for oil, linen, or cotton fibre.—*Eng. Lit. for March 1861* (p. 104).

Very clean and good plastic gear boxes as used by Fujiwara, No. 6. Use of this, at least, has a twelve-to-one ratio. His electric gear train is also well made, though for smoothness and speed I think they are not equal to some which we have constructed at London; but I believe Fujiwara's design is rather less than any which are made in this; no advantage which no doubt we are as soon be able to give their production. The same machine does not employ oil in the bearings of the electric gear box, but it is not so well made. These engines are most excellent when you can get them to go; for they show the greatest fire in their possible condition. But engines are not to be appreciated when a gear train can be made which I have made of these I think this comes from their elasticity and inability to become straight when you need the pressure, so that the point presents a certain amount of the stretch. Hence, when the elasticity is in this side, it must be very difficult to get the rest of the train straight.

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The device, with its applications, says McHrone, perhaps one of the greatest improvements in

Brachocle is not confined to Europe; it is just such in almost every country on the globe. Professor Burton, in his travels among the Indians north of Mexico in the state of New-York, saw the complaint in an old woman, the wife of the chief of that tribe. When this woman Burton learned that brachocle was by no means unknown among the Ojibwa Indians, the complaint existing in several of their villages. He found also that the disease resembled that seen in Europe, its progress in its varieties. He did not indeed himself see the paroxysms brachocle which descend over the breast; but he understood that it was not uncommon among the women on the banks of the Mohawk river, who were a particular den of its prevalence. In North America brachocle attacks persons of every age; but it is most frequently seen in adults; it differs from what is noticed in Europe. Brachocle is said to be frequent in Lower Canada. Eschscholtz, the companion of Humboldt, informed Albert that the disease was common in New Granada, and that it presented in such a degree in the little spots of Rucala and Narya, on the banks of the Magdalena river, that scarcely any of the inhabitants were free from it. The blacks and those who led an active, vigorous life, however, are reported to escape the complaint. Some of the natives of the influence of El Niño are said to be terribly distressed by it.—(Albert, *Nord. Nat. t. 1, p. 109*, also *Observations sur quelques pleurodynies peu communes pectore* in *globe pour les tropiques, d'après les plantes et les fleurs des Andes par A. de Humboldt, in *Annales de Physiologie par K. Magnus, t. 1, p. 109, Paris, 1824*.)*

In European women brachocle usually makes its appearance at an early age, usually between the eighth and twelfth year, and it continues to increase gradually for three, four, or five years, and is said sometimes to enlarge more during the last half year than for a year or two previously. It does not generally rise so high as the cap, as in the cases mentioned by Wiseman. Sometimes, however, this happens, as we see in the case of Constant Desnoes, of whom Albert has given an engraving. In this patient, a part of the tumor, as large as a hen's egg, projected into the mouth.—(*Nord. Nat. t. 1, p. 406*.) The swelling extended from the ears to the middle of the breast. A tumor produced a partial subsidence of it; but when it was withdrawn the tumor stood. After two years more, the swelling became painful, suppurated, broke place, and effused parts of matter were discharged; and six weeks every day after the swelling had subsided, came away with the dressings for three months; but notwithstanding all this suppuration, and more afterward, the tumor was only partially lessened. The disease, mostly like a pneumonia, firm, not soft, as Albert says, the flap or decay of a turkey-cock, the tumor being the largest part of the breast. Albert mentions a case in which the swelling hung down to the middle of the uterus, and the large mass, which was quite a tumor tumor patient, used to become hard and, as it were, frozen in very cold weather. This action, however, cannot be right, when he adds, that it was in part soft, distensible of elasticity.—(*Nord. Nat. t. 1, p. 406*.) In another curious instance, the tumor formed a long column which reached down to the middle of the thigh, the diameter becoming gradually smaller downwards.—(*Id.* 408.) The treatment of brachocle is the typical gland; but frequently the surrounding cellular membrane is more or less thickened, and constitutes the swelling. Sometimes also the neighboring lymphatic vessels are affected, when it is without and extends from one side of the neck to the other. In these circumstances, the swelling gradually increases itself as the surrounding parts, and is not compressible as an ordinary tumor.—(*Practical Medicine, 1824, 1825, 1826, 1827, 1828, p. 29*.) It is said, or rather before to the neck, and is much at intervals; but after a year, when it has ceased enlarging, it becomes firmer and more fixed. When the disease is very large, a generally moderate difficulty of breathing, which is increased by the patient's walking and or attempting to run. It seems to exert the pressure is so large, and affects the breathing so much, that almost what is mentioned; but there are many exceptions to this remark. Sometimes when the swelling is of great size, persons suffer very little inconvenience; great others are greatly oppressed, though the tumor is small. In general the immobility is

trivial. The voice is sometimes rendered hoarse, and is particularly easy the facility of speech is very considerable.—(*John Hunter, Colles, 1788, t. 2, p. 511*.)

The difficulty of respiration, produced by the pressure of the tumor and the enlargement of other glands, as this disease attacks, is the most dangerous effect of the tumor, since by disordering the pulmonary circulation, it renders the pulse irregular and intermittent, and a strong throbbing is excited in the region of the heart, followed by fatal disease of the lungs themselves; consequences often not supposed to have any connection with the brachocle, though it is in reality the immediate cause of them.—(*Vol. cit. p. 258*.)

The species of brachocle are little known. To the doctrine that brachocle is caused by the earthy impregnation of water used for drink, the following objections offer themselves: 1. The water of Denmark, in districts where this disease is considered endemic, contains much superabundance of lime; but that is opinion too about Nottingham, where the disease is also prevalent, is impregnated with sulphate of lime. However, that the disease is not produced by water impregnated by sulphate of lime is evident; for, as Albert observes, the waters of Saint Jean, Saint Ewald, and Saint Pierre, where brachocle is frequent, contain much less of this earth than the waters of Tignes, Montreux, where the disease is hardly ever noticed, though the lakes are built upon a vast quarry of gypsum. The same fact was observed by Bequaert in New Granada.—(*Nord. Nat. t. 1, p. 411*.) Nor, as Fournier explained, can the cause of the disease be correctly referred to the use of any particular kind of food. Certain localities, however, seem to contribute to its frequency; for the author observes, that the disease is not prevalent in very high places nor in open places; but that it becomes more and more common as we descend into deep valleys made by torrents. Where there is a good deal of marsh, and abundance of fruit-trees. The air is here usually humid. 2. Abstinence from unboiled water does not diminish or interrupt the gradual progress of the disease. 3. Patients are cured of the disease, who still continue to drink water from the same source as before, without making any pretension, as looking, &c. 4. The disease in this country is true frequently found among men. 5. Many instances may be cited of a swelling in the neck, sometimes very painful, and generally termed brachocle, being cured very readily, by difficult partition, violent suction, or any other unusually powerful effort.—(*See Edin. Med. and Surgical Journ. vol. 4, p. 253*.) When the gland is suddenly enlarged during a violent exertion, the disease is said to be produced by the passage of air from the trachea into the substance of the thyroid gland and surrounding cellular membrane. But whether this statement be a fact or not, it is unquestionably true, that in many patients the tumor always increases when they speak loud, sing, or make any effort.—(*Practical Medicine, 1824, t. 1, p. 411*; and *Practical Medicine, p. 54*.) The disease is sometimes seen in scrofulous subjects; but there is every reason to believe that it is quite independent of the other diseases, as Pott, Whistler, and Keatinge have particularly explained. The following are some points of difference between brachocle and scrofula, as indicated by Dr. Pott: 1. The true brachocle is simply a local disease of the neck, the surrounding being unaffected. In the contrary, scrofula extends its efforts to the whole system, attacking not only the lymphatic glands, but also the trachea, cellular parts, bones, ligaments, cartilages, and bones. 2. Scrofula is rarely cured by any agents; but brachocle often begins at a later age than scrofula, and does not, like the latter, spontaneously diminish as the patient grows older, and gains strength. 3. Scrofula is glandular, and separates and discharges, brachocle rarely separates these changes. 4. The histology of the upper lip of scrofulous subjects is not an indication of brachocle. And while the former patients generally enjoy these morbid faculties in perfection as long as they live, the latter disease in certain countries is distinguished with certainty. Scrofula is likewise always hereditary, while brachocle is not so, as healthy persons become scrofulous by living a long while among scrofulous parents, but rarely inheritive contract brachocle by going from a country where this disease is unknown, and taking up their residence in places where it abounds. 5. Nature does often cure

areola, while air is rarely successful; as the contrary, bronchocele is seldom cured by nature, but very frequently by art. The nature of this disease is described by Forster for the case of areola, is always tubercular; but in bronchocele it proves a valuable remedy.—(Pontioli, *Mineralogia della Svizzera del Grigione*, &c. p. 25.) The state of combustion in bronchocele with areola is now generally acknowledged. At the Hospital St. Louis, says Albert, areola presents areolae, while those with bronchocele are very rare. (*Nouvel. Nat. t. 1, p. 165*.) In Derbyshire, Greece, and Piedmont, bronchocele has been noticed in drinking water cool with ice. To this theory many of the opinions concerning the earthy impurities of water stand in full force; with this additional reflection, that the French, where snow-water is commonly used, have usually areolae, and not much with ice, says Wilson; and fewer areolae of them in Switzerland, where we have higher mountains and more snow than in Derbyshire, is well known; they are very common. But when pass the matter beyond a doubt is, that these were areolae in Piedmont, where there is no snow during any part of the year.—(Wilson's *Chemical Essays*, vol. 2, p. 157.) The above opinion was also refuted by Bader, who remarks that the Swiss areolae at the bottom of the glaciers are the most subject to the disease. Bronchocele is also said to be taken in England.

Regarding the influence of particular water in bringing on the disease, Dr. Oiler gives credit to the opinion, because it has appeared to him that distilled water prevented the increase of the disease, and even tended to lessen its bulk.—(*Journal Médical de la Faculté de Médecine de Paris*, 1806, t. 1, p. 101.) However, that every explanation, without exception, is fully proved by the observations of the celebrated Hahnemann. Persons afflicted with bronchocele (the areolae) are met with in the lower course of the Rhodanus river (from Honds to the confins of the Cava); in the upper part of its course (between Nyon and Honds); and on the flat high country of Bugey, six thousand feet above the bed of the river. The first of these three regions is a thick forest, while the second and third present a not dissimilar vegetation; the first and third are exceedingly damp, the second is peculiarly dry; in the second and third regions, the winds are equinoctial; in the first the air is stagnant. To these striking differences, we will add those relative to temperature. In the first and second regions, the thermometer runs up all the year between 51 and 52 rectifigree degrees; in the third, between 1 and 17 degrees. The waters drunk by the inhabitants of Marignat, Honds, and Bugey, are all good, where bronchocele never, or not often of areolae, and hence from rocks of granite and lime. The temperature of the waters of Bugey is and Nyon, drunk by those who have this disease, varies from nine to ten degrees. Bronchocele is the most frequent at Marignat, where the opinion which they offer grants are, according to our experiments, climatically more pure than those of Honds and Bugey, and where the climate is much less airy, than upon the banks of the Rhodanus river. Perhaps it may be thought that the state of the physical system (?) depends less upon the absolute temperature than upon the smaller refrigeration of the atmosphere, the difference of temperature in the night and day; but in the Rhodanus valley, where the coldness of low tropical regions prevails, the extent of the scale that the thermometer presents in the course of the whole year, is only a small number of degrees, &c.—(Hahnemann, in *Journal de Psychologie*, par J. Magon, p. 4, p. 188.)

The same distinguished observer confirms previous accounts of the variety of bronchocele under the original copper-colored natives of America and regions. It appears, also, that in South America bronchocele is progressively extending itself from the lower provinces to the distant regions of the Cordilleras; and this is no minor a degree less in fact the subject was affirmed to be a report sent to Congress by St. Rodriguez, one of the Colombian ministers.

An observation lately made by an intelligent writer would lead one to conclude, that system depends upon penetration of the land. Speaking of gales, as it appears among the inhabitants of the valley of Marignat, Bader formerly informed us, that in many of the cases this is the effect of deficiency in the

of the crusts, of which the smallness and narrowness of the areolae are especially remarkable.—(Mém. de Chén, *Mém. t. 1, p. 121*.) Dr. Costa thinks that remains of this sort may be owing to the severity of the cold damp air, as they generally appear in winter, and finally clear in the warm dry climates of Italy and Portugal. The latter part of the observation, however, is not correct, for that, Portugal, and other Italian writers, signify that the disease is extremely common in some of the watery parts of Italy. "Qua in Napoli, per tutto il corso, di stagione, non essendo mai in unione, che, come in Canada, ed in pochi altri luoghi."—(P. 21.) Prætor is inclined to consider the bronchocele as a kind of trophy of the thyroid gland, similar to the trophy of the ovary; and he mentions that Dr. Hanger discovered one thyroid gland which had been considerably enlarged, and contained many cysts filled with water. These, he erroneously concludes, must have been hydatids. Dr. Bader remarks, that which a tumor is made of the thyroid gland affected with this disease, the part is found to consist of a number of cells containing a transparent fluid fat.

In all probability the ordinary bronchocele is entirely a local disease; patients usually finding themselves in other respects perfectly well. The tumor itself frequently assumes to some extent the incompressible, and is only a deficiency. There is no malignancy in the disease, and the swelling is not prone to increase or suppurate, though, as Dr. Hanger remarks, abscesses do occasionally form in it. Although some of bronchocele becoming cancerous is singular. Mr. Good never knew life to be endangered by this sort of cancer, however large; a remark very much at variance with the observations of some other practitioners; but he had never given incision, as he thought it was not indicated with safety. In fact, the pressure of a large bronchocele may not only greatly affect the patient, by rendering respiration difficult, but actually cause death by asphyxiation.—(See also, our own observations, *congruente in Thèse de Médecine*, par J. Hénault, in *Bulletin de l'Académie de Médecine*, &c.) Some persons, as Albert remarks, have the disease all their lives without suffering any inconvenience from it; some experience a suffocating oppression at the breathing; and in others there is an impediment in the circulation, and a tendency to suppurate, arising from the stimulation which afflicts them.—(Nouvel. Nat. t. 1, p. 166.) Dr. Hanger says, that the bronchocele frequently appears two or three years before it affects the commencement of menstruation, and that it sometimes spontaneously disappears, when this cessation goes on in a regular manner. Mr. A. Burns affirms the same thing. On the contrary, according to Proust, this change in the constitution hardly ever affects the tumor.

TREATMENT OF BRONCHOCELE.

That certain localities, perhaps not yet correctly ascertained, contribute to the origin of this disease, is well proved by a fact stated by Albert, viz. that change of air has more effect on the complaint than incision, as he has known many Swiss ladies who came to Paris with bronchocele, in whom the tumor subsided after they had resided some time at that city.—(Nouvel. Nat. t. 1, p. 172.)

A blister kept open, has put a stop to the growth of the tumor; but this method is not much followed at present, as better plans of treatment have been discovered. A few years ago the discovery made of curing bronchocele consisted in giving internally burnt sponge, and occasionally a calomel purge, at the same time that friction was made upon the tumor itself. The utility of burnt sponge is the treatment of bronchocele, as Dr. Comber and others have now fully proved, depends upon the iodine in its composition.

The efficacy of burnt sponge was thought to be greatest, when exhibited in the form of a lozenge composed of tincture of the substance, but of burnt cork, and the same quantity of pulvis-stone. These lozenges were made into the proper form with a little sugar, and the lozenges were then put under the tongue and allowed to dissolve. To the latter circumstance much importance was attached. Some practitioners gave a large quantity of burnt sponge about three or four times a day, while others added a grain of calomel to each dose. A purge of calomel was ordered about once a week or fortnight, as long as the patient persevered in the use of the calomel sponge; but when mercury was continued 9 or 12

with dose of this medicine, no economical purgative was deemed requisite.

External means only very externally assist the above internal remedies. Frequently rubbing the swelling with a dry towel, bathing the part with cold water, rubbing the tumour two or three times a day with the oil, arsenic, &c., is the domestic treatment; and the best usage of this kind which the surgeon can take.

"In the treatment of bronchocele," says Mr. A. Farre, "a repeated topical extraction of blood from the tumour is highly beneficial. Externally also, but sometimes a marked effect; but there is no remedy which I would more strongly advise, than regularly and long-continued friction over the tumour. My perseverance in this plan, a bronchocele, treated in London, was materially relieved in the course of six weeks. Its good effects I have likewise witnessed myself; and it is a remedy highly recommended by Goussier in his 'Étude des Goitres.' It has also been much used in scrophulous tumours by Mr. Goussier, of Orléans, and by Mr. Russell of Edinburgh."—(*English Anatomy of the Head and Neck*, p. 294.)

Mr. A. Farre recommends the friction to be made with dressed linseed, with four ounces, being the part to be rubbed at least three times a day, for twenty months.

In two cases of bronchocele related by Mr. Clarke, the patients were cured by "the merely use of the compound plaster of ammoniac and mercury, composed with the internal exhibition of burnt sponge and medicinal purgatives."—(*See Eng. Med. and Surg. Journal*, vol. 4, p. 294.)

We learn from Professor Ollier, that, in Geneva, bronchocele used to be cured by burnt sponge withlaid in powder or infused in wine, and combined with purgatives to prevent the escape of the mercury, which sometimes accompany the absorption of the swelling. Muriate of barytes has likewise been recommended.—(*See Manuel de Médecine Pratique*.)

Mr. Wilmer, considerably improving upon Ollier, in the changes of the tumor, used to begin with six scruples the day after the full moon, and to give a pill the evening day. The night following and seven nights successively he dropped the above-mentioned liniment to be put under the tongue at bedtime, and administered every room a better tolerable powder. On the eighth day the purge was repeated, and in the case of the succeeding ones, the whole process, except the emetic, was renewed.—(*Cases in Surgery*, Appendix.) This, which is often called the Coventry plan of treatment, is said to be greatly assisted by rubbing the tumor with an ointment containing hen's egg.

Prosser succeeded with his patients, though the patient was twenty-two years old, and the swelling had existed more than twelve years. It is said that no instance of cure has been known after the patient was twenty-five. Prosser orders one of the following projects to be taken early in the morning, an hour or two after breakfast and at five or six weeks in the evening, every day, for a fortnight or three weeks. The powder may be taken in a little syrup or sugar and water; R. Camph. and op. levigated, each ʒij. of pulp. ʒij. gr. ss. M. ʒij. of oil. ʒij. ʒij.

Three powders should be taken for two or three weeks, and then left for a week or nine days before a repetition. At bedtime every night, during the second course of the powder, some purgative pills composed of mercury, the curative colic, castor, rose, and rhubarb, are to be administered; and in general it will be proper to purge the patient with opium or salts, before beginning with the powder. Prosser put his faith in external applications.

Some have recommended giving two scruples of colored sugar daily every morning, in a glass of red wine; half a drachm of the sulphate of potash every day dissolved in water; or ten or fifteen drops of the third spirit, twice a day, the dose being gradually increased. Muriate of barytes, &c., and belladonna have also been advised. Podagrace commends the mixture of tar as a remedy in producing great effects. The remedy is said to be taken with honey, so which is sometimes added burnt sponge, with camphor in powder. He employs also decoction with flaxseed, linseed, and sometimes gargar with calomel. The tumor is placed under the tongue, and allowed to dissolve slowly.—(*P. 26, 27*.)

Dr. W. W. physician to the emperor of Russia, prescribes three grains of the sublimate of mercury,

dose of the anhydrous trisalt of iron, four of burnt sponge, and ten of the bark of *Quercus*, divided in a treble dose, one of which is given twice a week with a gentle laxative at night. He also directs twenty-four leeches to be made, by introducing an ounce of burnt sponge with an equal quantity of the powder of quercus, and fifteen grains of castor-oil, first blended with a sufficient quantity of the spirit of camphor. One of these leeches is put under the tongue daily and allowed to dissolve there. Lastly, to the tumor itself he applies a plaster composed of half an ounce of sulphur, a drachm of the sublimate of mercury, and 33 grains of arsen. tartar.—(*J. Allier, Nouv. Jour. de M. p. 374*.)

The nature of burnt sponge in the cure of certain forms of bronchocele was first ascertained to be owing to the iodine which it contains. Iodine was discovered in 1812 by Courcier, superintendent of salt-pans at Paris; but six years elapsed before it was tried as a medicine. From the first meeting of Dr. Couderc, witnessed in 1818 in the Helvetic Society of Natural Sciences, it appears, that as he was searching for a formula in the work of Calot de Goussier, he found that Couderc had recommended the ashes of the *Juncea viscaria*, or *Sedum viscaria*, under the name of *sedum viscaria*, for the cure of bronchocele; and he was led from analogy between this substance and burnt sponge, so long celebrated for its efficacy in the treatment of bronchocele, to suspect that iodine was the active principle of both. "The great and unexpected success which resulted from its use in the treatment of bronchocele, it once revealed the power of iodine as a therapeutic agent, and encouraged Dr. Couderc to pursue his researches in endeavoring to ascertain the nature of the materia medica; and about the close of the same year, when Dr. Couderc had employed iodine in treating piles for six months at least, his conjecture was confirmed by the discovery which Dr. Fyfe of Edinburgh made, that this substance was actually contained in the ashes of the burnt sponge." &c.

"It has been generally understood among the physicians, that the happy conjecture which introduced iodine into medical treatment, originated with Dr. Couderc of Geneva; yet we find that his claim to this honor is disputed by one of his countrymen, Dr. J. J. Struth, of Neuchâtel, in the *Archives de Médecine*."

Dr. Struth, whose communication is found in *Prosser's Memoirs of the Helvetic Society of Natural Sciences* for 1820, states, that before the discovery of iodine, attempts had been made to compound a substitute for burnt sponge, but without success, and that this failure and his observation of the similarity of smell between iodine, burnt sponge, and other marine productions, led him to suspect the existence of iodine or its salts in these substances, and that he observed in the artificial compound was the cause of failure in those experiments. This conjecture, which appears to have been made previously to 1817, led Dr. Struth to examine the real burnt sponge, and to inform us, that though his time did not permit him to ascertain exact quantities, yet he obtained from 15 gr. of burnt sponge an ounce of iodine as to render his conjecture probable, and to be ascertained that the agent that should have escaped notice. He was therefore at once induced to think of its use in medicine; and in the same paper from which we derive these facts, improved with the poisonous quality ascribed by Deleuze to iodine, he recommended first the trial of its salts, especially the hydroiodate of soda and lime, and that that of the substance itself.

The communication of Dr. Struth is dated Dec. 1818, and was actually published in *Prosser's Memoirs* in the periodical work in February, 1820, two months at least before the first meeting of the Couderc, was communicated to the Helvetic Society of Natural Sciences at Geneva. It is unnecessary to insist on the force of any supposition of iodine dose to Dr. Struth; which has led to it in right to deprive Dr. Couderc of the merit of originality in ascertaining the direct and certain action of iodine, on the irregular and sometimes local qualities of burnt sponge in the treatment of piles. Consideration of this kind is not uncommon in science; in the present instance, the superiority of Dr. Struth does not diminish the merit of Dr. Couderc.—(*See Eng. Med. and Surg. Journal*, N. 85, p. 210, &c.)

That iodine is a medicine of considerable efficacy in

Academy of Surgery at Paris, in which the disease had been got rid of either by means of a seton, drawn through the swelling, or the application of an issue.—(*Revue Méd. et Chir. Paris*, 1775.) The successful removal of setons was also adverted to by Richter in the year 1780.—(*Abhandl.*, 3, 9, p. 478.) And the plan is spoken of in another work, published in 1786, as being eligible where the disease is accompanied with a cyst.—(*Encyclopædie Méthod. par M. Cuv.*, t. 1, p. 231.) The practice was particularly resorted to by Pott in his valuable treatise on aneurysms; and Aldert testifies the success as being met at the Hospital St. Louis.—(*Médec. Nat.*, t. 1, p. 466, *ed. Paris*, 1817.)

In November, 1837, Dr. Blandin, of Naples, tried this practice, which he accordingly supposed to be efficacious. "By means of a bronze-pointed needle six and a half inches long, I passed (page 83) a seton from above downwards through the gland, to the depth of about four lines from its surface. Suppuration took place in forty-eight hours. By the 15th of November, the tumor ceased, when the matter was squeezed out; and the irritation occasioned by replacing it, produced an abscess on the right side of the neck, which was opened on the 23d, when it was found that the suppuration had effected the destruction of nearly the whole gland." The woman, who was thirty-six years of age, was sent by Dr. Blandin, in April, 1838, with the circumference of her neck increased from sixteen to fifteen inches, French measure. In another case referred to, a seton was passed through each side of the thyroid gland, and the result was a removal of the tumor on the side where the seton was maintained long enough; but on the opposite side the seton being withdrawn too early, the tumor collected in a seton, and at the end of four months a discharge still continued, the patient refusing to have a further opening made. When the seton does not prove stimulating enough, Dr. Quain sometimes enlarges it, or attaches to it catarrhic or irritating substances. He also frequently uses two setons. In one example, in endeavoring to perforate the gland rather deeply, Dr. Quain appears to have injured the larger branches of the thyroid arteries, so that there was a source of blood was destroyed, and the tumor swelled as if injected with blood. The bleeding, however, ceased spontaneously. He states that the seton has been passed through the tumor as low as sixteen times, the disease being varied in every instance, without upward ascent; and he is confident, that unless the needle be pushed deep enough almost to touch the thyroid cartilage, the trunks of the thyroid arteries will not be exposed to injury, while the trachea is the track of the needle will not cause any danger. He inserts also upon the propriety of retaining the seton in the tumor a considerable time; and observes, that it remains to be ascertained whether this practice will answer in every description of bronchocele. For these and several other cases and particulars, the profession is indebted to Dr. Sarsville.—(*See Med. Chir. Trans.* vol. 10, p. 16, &c.)

Mr. Gussing applied a seton in a case of bronchocele in St. George's Hospital; but in this instance the irritation brought on sloughing, and the patient after a time died. The particulars of this case, and of three successful examples of the practice in England, have been lately recorded. One of the successful cases was treated by Mr. David M. Jones, of Exeter, brother by Mr. A. C. Hutchinson, who has taken the trouble to collect the history of these, and the third by Dr. A. T. Thomson.—(*See Med. Chir. Trans.* vol. 11, p. 223.) Percy and Desautel have also employed setons in bronchocele with success. The plan, however, is sometimes inefficient, as is proved by two cases under Dr. Keen's, of Glasgow.—(*See London Med. Repository* No. 93, Feb. 1821.) The great source of cases referred to this practice, and their difference from other cases, which are brought by treatment of a different kind, are still doubtful in surgery.

The diseased thyroid gland has been successfully extirpated; but the operation is one of so much danger, that a slight resort to be attempted except under the most pressing circumstances. The most large arteries are usually distributed to the gland itself; their still greater size is bronchocele; and the vicinity of the carotid arteries, and important nerves, render the excising a thing of no common difficulty.

Mr. Gooch relates two cases, which do not engraft

the practitioners to have recourse to the excision of enlarged thyroid glands. In one, we suppose an aneurysm took place, and the surgeon, though usually bold and experienced, was obliged to stop in the middle of the operation. No means resulted in entirely suppressing the bleeding, and the patient died in a few days. In the other, the same event finally took place, the patient's life being saved only by compressing the wounded vessels with the hand, day and night, for a whole week, by persons who relieved each other in turn. This was found the only way of stopping the hemorrhage, after many fruitless attempts to do the same.

Hæmorrhage is not the only risk; Desautel related a large bronchocele that caused dangerous pressure upon the trachea; the whole gland was taken away, and the four thyroid arteries and many veins secured. Only a few apostles of blood were lost. The woman, however, died soon after the operation, was pale, had hurried respiration, cold skin, sickness, and, denoting agony of some important nerve.

I do not mention these facts to deter surgeons from the operation altogether, because it is proved by modern experience, and especially by six cases in which Dr. Hodgson, at Dresden, has successfully removed the thyroid gland, that not only is it occasionally a necessary proceeding, but one that may be well accomplished by a skilful operator, as will be particularly explained in a future article.—(See Thyroid Gland.) When bronchocele by their present dangerous obstructed respiration, deglutition, and the removal of blood from the body; and when the disease reveals the vicinity of trachea, a seton, Hodgson, and every other plan of treatment found deservings of study; what can be done with the view of saving the patient, but the bold operation of cutting away the swelling, or that of exposing and tying one or both of the upper thyroid arteries?

When the quantity of blood flowing into a tumor is suddenly and greatly diminished, the size of the swelling commonly soon undergoes a considerable diminution. The experiment was once made by Mr. W. Hare, in tying the arteries of an enlarged thyroid gland, and, in a week, the tumor was reduced one-third in its size. The ligatures then sloughed off, repeated bleeding took place from the arteries, and by the extension of tracheal compression, the carotid itself was exposed. The patient died; yet, as Mr. A. Burns observes, this does not suffice against a repetition of the experiment; as the same thing might have happened from merely opening a vein, and, in the removal of air of a tumor, has actually happened.—(*Surgical Anatomy of the Head and Neck*, p. 292.)

In fact, the immutability of the experiment prevented surgeons from being introduced by the failure in question; and, with that laudable spirit for the improvement of operative surgery every where diffusing itself through the profession, other gentlemen were soon found who had judgment enough to make further trial of the practice. In a young man, twenty-four years of age, whose breathing was much impeded by a bronchocele, and whose upper thyroid arteries were very large, and affected with strong pulsations, Wither, of Leeds, tied the left of these vessels, the left side of the gland being the largest. The operation was done on the 24 of June, 1814. An incision, an inch and a half in length, was made in the direction of the lower edge of the sternum-musculo-sternal muscle, where the throbbing of the artery was quite distinct. By a second stroke of the knife, the playmate *arteria* was divided at the same distance, and to an equal extent. The vessel was then exposed by a careful dissection, and separated from the surrounding parts, and one arterial branch which was divided was immediately secured. A ligature composed of three silk threads, was then applied with an American handle, under the left thyroid artery, and tied with three simple knots. The wound was then closed with adhesive plaster, and the ends of the ligatures brought out at the angles. The ligature on the large artery gave energy on the 15th day; and, without any febrile symptoms, or other bad consequences, the wound was perfectly healed on the 25th day. As early as the third day after the application of the ligature, the left part of the tumor began to be less tense, and the throbbing less as it soon ceased. By degrees it diminished away, becoming as it lessened harder and, as it were, cartilaginous. In a

fortnight, the left half of the swelling was one-third smaller than before the operation; and, in length, only one-third of it remained, while the right side also was somewhat smaller. On the 17th of June, Weather took up the right segment of the artery, which was more difficult to get at, as it lay more deeply, and was much encased under the external gland, which had pushed it out of its natural situation. The operation lasted three-quarters of an hour, and several large and small arteries which were cut were tied. With respect to the thyroid artery itself, it could not be tied without bleeding a part of the gland in the incision. No satisfactory spasmatics followed the second operation; the ligatures were detached in good time, and the wound healed very well. The right portion of the bronchocele also now disappeared; but though it was certainly smaller than the left, it did not entirely relax so completely as the latter. The result of the operation, however, three years afterward, produced no inconvenience, and resembled the quiet way—(See *New Bedford der Kregein*, &c. vol. IV. p. 10. and *Walters*, p. 15. &c. New York, 1871.) On the 21st of December, 1853, Mr. H. Collins of Philadelphia, took up the superior thyroid artery for the cure of a bronchocele, which, in a young woman aged seventeen, had pressure on the trachea and oesophagus, attended with a great degree of swelling. The superior thyroid artery was in this instance large and pulsated strongly. Mr. Collins cut down upon the left of these vessels, separated it from its accompanying artery, and passed under it a small round ligature, which was drawn suddenly tight and cut. The next day there was hæmorrhage, and some swelling of the neck and side of the head, with increased difficulty of swallowing and flatulency of the bowels. These complaints, however, were relieved by bleeding and antiseptic medicines. The ligature came away on the 5th day; and on the 14th, the wound was completely healed. On the 14th of February, the breathing being much improved, and the patient relaxed nearly to quadruple of its former size, the patient was very much to be discharged from the infirmary. (See *Med. Clin. Trans.* vol. III. p. 312.) My friend, Mr. Ross, once mentioned to me a case, in which a similar operation done by Mr. Brooke, did not produce any material diminution of the tumour.

Dr. Parry has remarked a frequent coincidence, either as cause or effect, between enlargement of the thyroid gland and cardiac diseases. (—*Elements of Pathology*, 5th p. 182.) And another modern writer mentions, that he has lately seen three cases of this coincidence. (—*Medico-Chir. Journ.* vol. I. p. 191.) A case is detailed by Flajous, where the disease was accompanied with extreme fatty degeneration of the heart. (—*Soc. Colloquie d'Chirurgie*, &c. 4th Christian, 1. 2, p. 270.) In the instance here referred to, there was great irregularity of the pulse, and the symptoms of the breathing was such, that the patient was obliged to submit to respiration at least every month, whereby he was rendered quite enervated.

The prevalence of goitre in different parts of the U. States is stated by our authors, and several American writers have described the disease as existing in various parts of our country, which produce instances very widely differ in many respects. In Vermont, in New-York, in Pennsylvania and Ohio, the disease is by no means infrequent. Professors Burrow and Gibbon, of Philadelphia, have communicated many valuable observations on this disease. More recently, Professor Francis, of New-York, has made a series of observations of goitre as it appears in the western part of the state of New-York. From the communication with which he has kindly favoured me, the following abstract is given. I may add, that according to the facts deduced from the changes which our country undergoes in the progress of improvement, we have the strongest reasons to believe that as the climate and cultivation are extended, the frequency of the existence of this disease will diminish, become, so to speak, a relic.

However frequent cases of goitre may have formerly been in the state of New-York, the fact is certain, that they are much more rare at present. Even the hyperæmias of the larynx, which Dr. Dwight, relative to the great prevalence of the disease, thought among the most frequent with which we have been favoured, are to be regarded with astonishment. That in particular portions of our western valley popular examples are to be

found, may be known by any accurate observer. But—in the village of Union, (near Dr. Francis's) which contains between 1 and 2000 inhabitants, no case of bronchocele could be pointed out, and this village occupies the site of old Fort Schuyler, on the Mohawk, the vicinity of which has been referred to as the spot where goitre was particularly prevalent. I am strengthened in the accuracy of this statement relative to the almost total disappearance of goitre in this neighbourhood by the testimony of Dr. Coventry. A similar remark may be made with regard to the former frequency of the disease throughout the extensive region from Utica to Buffalo. The late Ulrich Tracy, in his extensive travels this country some years since, was led to believe this bronchocele prevailed in the wilderness as well as in the town, and thought it peculiar to the country of lakes. In my late visit I made special inquiry as to the present condition of the health of the inhabitants, and ascertained that the instances of goitre are nearly none save those in the period of Mr. Tracy's observations. The number of cases which exist under any name during the year were twenty-three. These were at Herkimer, Morris, Syracuse, Oneida, Hamilton, Williamsville, and Buffalo; and I saw none else in the neighbourhood of Buffalo than at any other place. In other parts of the state the disease may be seen, particularly in the county of Albany.

To assign a satisfactory cause for the disease is difficult, perhaps impossible. Dr. Burrow has endeavoured to show that goitre and enlargement and tenderness of the heart have one common origin, and argues this opinion from the simultaneous prevalence of these diseases, from the frequency of glandular affections where malignants abound, and from the opinion that persons afflicted with goitre are exempt from intemperance, though in the midst of these diseases. Dr. Coventry inclines to ascribe it to drinking water impregnated with alum. Dr. Dwight advocates the more recent opinion that these affections originate from the lime contained in the water drunk in those regions. Dr. Francis ascribes the production of the disease chiefly to humidity, and hence it prevails most in the vicinity of lakes and rivers where vegetation abounds. He says, it increases with the rainy seasons, and is diminished when the weather becomes cold and dry, and hence argues the reason of its disappearance as the country becomes drier. He however does not altogether reject the agency of certain waters in aggravating if not producing the disease.

On the 23 cases examined by Dr. Francis, two only were in male subjects, and one of these in adult Indians, in Niagara county. He saw it in an infant but a few months old, and he subscribes to the opinion that it often depends on constitutional causes, and is sometimes hereditary.

In Onondaga county, Dr. Francis learned that goitre prevailed among sheep, and Fodder grew as a regular fact of its hereditary among dogs. The treatment of blisters and others, in considering the several functions connected with this disease, are limited by its greater prevalence among women, and also according to Dr. F. by some well-known facts connected with parturition.

Dr. Coventry has removed several cases of goitre by the simple expedient of the patient wearing the rotation of water about the neck. The recent plan of Mr. Hoffman, of employing steady pressure, has been tried in this country with some success. The efficacy of hard sponge has often been seen; but instances of its being are not infrequent. The iodine has been used of late years with the best effects, and Dr. Congdon, of Buffalo, has reported its cases where it is a number of cases.

Dr. Francis observed one, that in a subsequent journey through this state, he found a number of interesting cases, and that the disease in every instance afflicts the female sex, and in each of these cases it was directly associated with the formation of tumours and polypus. The left lobe of the gland was most frequently the seat of the disease, but in no instance was it connected with cancer. His reports are instances of the cure of a female case which occurred in a young married woman, who, after leaving the neighbourhood of Onondaga and removing to the western state, after a residence of three years, was seriously afflicted of her goitre.

died of asphyxiation. On dissection, no inflammation in the larynx was observed, but only an inflammation of its membrane, and a spot like a small pea pointed upon the margin of the glottis.—(*Foreign Obs.* part 1, p. 18.)

Children sometimes accidentally drink boiling water from the spout of a tea-kettle. The effects of this accident (says Dr. Hall) are not, as might be supposed, a puerile, the symptoms of inflammation of the mucous membrane, but of inflammation of the glands and vessels, resembling those of erysipelas; and the case constitutes another instance, in which the operation of leeches, locally, or of leeches only, may be performed with the effect of procuring suppuration, and perhaps of curing it.—(*Med. Obs. Trans.* vol. 12, p. 2.) The cases and remarks collected by Dr. Hall, Mr. Gilman, and Mr. Stilling are this subject, cannot fail to be highly interesting to practitioners. In a case of the foregoing description, Mr. Wallace, of Dublin, performed tracheotomy with success.—(*See Lond. Med. and Phys. Journ.* for July, 1822.) Mr. Simpson, who has seen five cases, in 1813, looking upon water taken into the trachea, thinks that death, when it follows, is almost always produced by asphyxiated inspiration. In one of the examples which he has recorded, bronchovaginal was the means of saving the child.—(*See British Hospital Reports*, vol. 2.) Great mechanical injury of the larynx, caused by a blow or fall, may even the way to bronchotomy, as is proved by a case lately reported by Mr. Latham.—(*See Ed. N. S. and Surg. Journ.* vol. 16, p. 553.)

There is no inconsiderable diversity of opinion among eminent surgeons as to the propriety of performing tracheotomy in cases of croup, and those who oppose the operation, very justly allege, that in the intermediate stage of croup an advantage can result from the operation, however favourable the condition of the surface may be in other respects. The views of the celebrated Cullen would seem to yet beyond doubt the utility of the operation as already stated, by our author, because it is analogous in its removal of the accidental inflammation which is effused in the advanced stage of croup to the trachea. I am not prepared, from my own experience, wholly to decide the difficulty. We have evidence sufficient, I think, to justify an occasional recourse to this extreme of surgical skill, but there is still another stage of relief, not stated by our author, that may fitly be introduced here, which will often render this operation unnecessary, even in those cases in which it is confidently recommended by some, and certainly ought to be fully tried before we avail ourselves of so doubtful a remedy.

In that stage of croup which has been aptly termed the fatal stage, from its so generally proving such, and which is characterized by the existence of the membrane, the viscous crusts have been introduced with decided success.

This practice was first introduced by Professor Francis, of New-York, in 1812; and since the report of its success, has become very generally adopted in this country, and with singular success. I have now in my possession a specimen of an entire membrane lining the trachea, detached and thrown up under the powerful electric action of the blue vitrol, after venesection, blisters, calomel, purgative, &c. and all the approved remedies had been tried ineffectually.

I regret that the facts assigned do not preclude my presenting an interesting detail of this case reported by Dr. Francis, in his valuable paper published on this subject, and have to content myself with referring to the (*N. Y. Med. and Phys. Journ.* vol. 2, p. 58, of seq. only remarking, that in the latest hopelessly state in which the aspects of asphyxiation are so threatening, relieved, in large doses, as among the most efficient remedies to which we can have recourse. "After the removal of the membrane," observes Dr. F., "and when the progress of life on the lungs, is a judicious and sometimes an available resource," and he adds that in the cases in which he failed the viscous crusts were successful, their agency was probably destroyed by that potent remedial.

I think similar practice has been adopted by Dr. Hoffmann, of Vienna, who first used the viscous crusts in 1820; and so striking does he consider them, that he declares their action to be a specific in this stage of croup. These arguments, saying too much in their behalf, are certainly they are treated in large quantities, and ought never to be omitted in some striking favorable cases.—(*See*.)

2. The compression of the trachea by foreign bodies,

lodged in the pharynx, or by tumours, formed externally, and of sufficient size to compress the windpipe, but not admitting of immediate removal, is an equal reason for operating more or less expediently, according to the symptoms. Mr. B. first mentions two instances of suffocation from bodies falling into the pharynx. Respiration was only stopped for a few minutes; but the cases were equally fatal, notwithstanding the employment of all the usual means. The author thinks that hemorrhage would have been attended with complete success, if it had been performed in time. The operation should also be done, when the trachea is dangerously compressed by tumours. The author of the *Encyclopædie*, observes, in *Encyclopædie Médecine*, says, that about twenty years ago he attended a man, who had had an aneurysm, which came on instantaneously. He had had, for a long while, a breast tumour, which was of an enormous magnitude towards the end of his life. The cavity of the trachea was so obliterated, that there was scarcely room enough to admit the thickness of a small piece of osseous. Doubtless, bronchotomy, performed before the aneurysm made its appearance, might have prolonged that man's days.

In cases of this last description, Denon would have advised the introduction of an elastic gas catheter into the trachea from the nose, in order to facilitate respiration. This practice, I believe, has not hitherto been attempted by English surgeons.—(*See Médecine Clin. de Paris*, t. 2, p. 235, &c.)

Hartree successfully performed this operation on a female seven years old, who, having heard that gold, when swallowed, did no harm, attempted to swallow nine pencils, wrapped up in a piece of cloth, in order to hide them from her father. The pencil, which was very large, could not pass the narrow part of the pharynx, and here it lodged, so that it could neither be extruded nor forced down into the stomach. The boy was in the point of being suffocated by the pressure which the foreign body made on the trachea; and his neck and face were so swollen and black, that he could not have been known. Hartree, in whose house the patient was brought, attempted in vain, by different means, to dislodge the foreign body. At length, perceiving the present an evident danger of being suffocated, he resolved to perform bronchotomy. This operation was however done, thus the swelling and lividity of the face and neck disappeared. Hartree passed the piece of gold down into the stomach with a broken probe, and the pencils were, at different times, discharged from the nose, salt or tea days afterward. The wound of the trachea was healed.—(*See Médec. de l'Acad. de Chirurgie* from 11, p. 312, &c. in *France*.)

In such a case Denon would have introduced an elastic gas catheter into the larynx, instead of performing bronchotomy, which could not answer, yet the foreign body was down.—(*See Chirurgical Anals.* t. 2, p. 247.)

3. Foreign bodies in the trachea may render it necessary to practice bronchotomy. Here I ought not to say, perhaps, laryngotomy, which by several surgeons is deemed most applicable.—(*Quæst.* C. III, Surg. Obs. part 1, p. 67, &c.)

Little is so ancient as the observation on extraneous substances in the trachea, has proved, more successful than all other gooding writers, the necessity of the operation in circumstances of this kind. The following case will render his observation.

On Monday, the 10th of May, 1729, a little girl, seven years of age, playing with some dead lily-buds, threw one into her mouth and thought she had swallowed it. She was immediately attacked with a difficulty of breathing and a severe convulsive cough. The little girl and her mother swallowed a loaf, and such assistance as was thought proper was given, but Ward of success was the cause of several symptoms being successively sent her, who finally employed the different means prescribed by art for extraneous foreign bodies from the œsophagus, or forcing them into the stomach. A life species cautiously inserted to the end of a whalebone probe, was repeatedly introduced through the whole extent of the œsophagus. The little girl, who made a sign with her fingers, that the foreign body was situated in the middle of the neck, thought that she felt some relief when the sponge was conveyed below the place which she pointed out. She had every now and then a violent cough, the efforts attending which produced copious fluids in all her trachea. Duglès

seen was unobstructed; and warm water and oil of sweet almonds had been swallowed without difficulty. Two whole days had been passed in suffrage, when the pulmonary crisis in Louis. The little girl, with all possible fortitude and courage, was several times told in the friends' ears ready to die of suffocation. Louis, when aware of what had happened, came into the room where the patient was. She was sitting up in her bed, suffering no other symptoms than a very great difficulty of breathing. Louis inquired where she felt pain, and she made such a sign in reply, as left no doubt concerning the nature of the accident. She put the index finger of her left hand on the trachea, between the larynx and epiglottis. The friends always which had been made in the epiglottis with a view of discovering the foreign body, the nature and the position of this body, which was not such as would be adapted to the passage for the food; and the facility of swallowing, were negative proofs that the want was not in the oesophagus. Respiration was the only function disturbed; it was attended with difficulty and a rattling in the throat. The little girl expressed a filthy smell, and she pointed out so sensitively the painful point where she coughed, producing all her sufferings were removed, that Louis did not hesitate to deduce from the relations, from this single inspection, that the lesion was in the trachea, and that there was only one way of saving the child's life, which was to make an incision for the purpose of extracting the foreign body. He required then, that the operation was neither difficult nor dangerous, that it had succeeded as often as it had been practiced, and that the very passing danger of the case only just allowed time to him, the opinion of some other well-informed surgeons, respecting the indispensability necessity for such an operation. Louis thought this permission necessary in order to acquire the confidence of the parents, and to shelter himself from all reproach in case the event of the case should not correspond with his hopes. Louis went home to inquire all the requests he transmitted, and in two hours he was informed the surgeons who were consulted waited for him. After Louis was away, his child had become quiet, and was now lying on its side asleep. The opinion he had delivered had been explained by the friends and attendants, and had been discussed before his return. They who had been consulting their associates, on the supposition that the foreign body was in the oesophagus, cannot approve of the proposal of extracting by an operation a substance the presence of which in any part of the body was not obvious. Louis explained his advice in regard to bronchotomy, and did not expect a doubt to be set up against its positive a fact. It was objected, that a substance as large as a bone could not introduce itself into the trachea. He brought every line into his argument by a short explanation of cases of this sort with which he himself was acquainted. The little girl was examined; she was better than when Louis saw her before, and a very palpable emphysema was seen above the clavicle on each side of the neck, a symptom which did not exist two hours previously. This swelling made Louis conclude, that the impurity of the operation was still greater. The friends whose confidence had been shaken by the objection he had expressed in relation about anatomy, were in the greatest embarrassment when they were told, that the child might die of an operation which he had represented as only a simple incision free from all danger. Louis was repeatedly asked, if he would be responsible for the child's life during the operation, and he was told, that if there were any thing to fear during the operation, it would be from the accident itself and not from the resistance required. This declaration was not perceived, and Louis withdrew, at the same time relating his opinion to the solution of two points of medicine, the effect of which would be useless and might be dangerous. The medicine was given in the night; the child was fringed with an operculum and quite unconscious. On Tuesday morning, Louis found her more quiet, smiling, who had said that she was getting better. Louis was wonderfully well. The operation, however, continued to be still attended with a rattling noise, which Louis had observed at the opening when the breathing was much more laborious. The child was nearly suffocated several times in the course of the day, and died in the evening, three days after the accident.

Bordenave, who had seen the patient, referred Louis to the child's death on Friday. The body was opened before a numerous assembly of persons. After making a longitudinal incision through the skin and fat along the trachea, between the sternohyoid muscles, Bordenave slit open the trachea, cutting three of its cartilages. At this instant every one could see the lesion, and Louis took it out with a small pair of forceps. It was smaller than the size with which this foreign body was suspected, that the operation would have had on the living subject the most salutary effect. The relations had to regret having sacrificed a child which was dearer to them than immolation and a remedy which the most judicious attempts could not remove.—(*Mém. de l'Acad. Royale de Chirurgie*, t. 12, p. 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

This case strikingly illustrates the symptoms which result from the presence of foreign bodies in the trachea, and shows the only surgical proceeding which can be of use. But among the phenomena apparently difficult of explanation, is the cause which at intervals followed the afflicting cough.—*See Dr. Boerhaave's Case in Med. Obs. Voyes vol. 12, p. 61.* Answere, however, has dispelled much of the doubt of this matter. It is known, that the whole coat of the trachea is much less sensible than the mucous glands. A foreign body, then, a body, only remains a certain time in that coat without much inconvenience, the passage being only somewhat obstructed, according to the position of the substance. It may even remain several days, weeks, or years, without producing any symptoms of its presence, except a slight sensation of constriction, and this is what happens when the body lodges in one of the ventricles of the larynx. Cases of this kind are to be found in Truppius, Bartholin, and many other observers. But when the substance substance gets its position and is carried into the trachea, the irritation which it produces there, and particularly about the larynx, sometimes coughing; and it, in the first, the foreign body should become fixed between the apex of the glottis, it may cause inflammation, and, as probably has happened in many of the cases of suffocation from extraneous substances.

Another remarkable circumstance which deserves more attention, as it confirms the position of a foreign body in the trachea, is the emphysema which appeared about the clavicle towards the termination of the case. Louis did not believe that any of the persons who saw the patient could ascertain a just idea of the origin of this symptom. The supposition that the obstruction which the foreign body caused, for two days, to the free passage of the air, might have occasioned a forcible distention of the trachea, and a rupture of the membrane which connects together the cartilaginous rings of this tube, was dispelled by the examination after death. The windy tumour had not originated in the circumference of the trachea; here its limits were very wide. The very substance of the lungs and the mediastinum were emphysematous. The air confined by the foreign body had ruptured the air-vessels during the violent fits of coughing, and thus continued itself into the interlobular cellular substance of the lungs. Thence it had passed into the cellular substance of the lungs; and afterward into that containing the pleura, communicating with the outer surface of these organs; and by the communication of these cells with each other, it had produced a prodigious swelling of the cellular substance between the two layers of the mediastinum. The emphysema is so general, it length made its appearance above the clavicles. The swelling of the lungs and the surrounding parts, in consequence of the introduction of air into the cellular substance, is a manifest sign of suffocation. The inflammation appears to be so natural an effect of the presence of a foreign body in the trachea, that one can hardly believe it is not an essential symptom, though before Louis he neither had been noticed of it.

Foreign bodies in the trachea, however, do not always cause death so suddenly, which may be owing to their smallness, their position, or the situation in which they are fixed. An example is related in the *Epitomae Cur. Naturae*, lib. 2, cap. 13. As a woman was swallowing a cherry, the stone of the fruit passed up the trachea. A violent cough and excessive efforts, as it were, in vain, were the first symptoms of the accident, and of those the patient thought he should have died. A sleep of some hours followed the terrible

agitation, and the patient afterward did not feel the least inconvenience during a whole year. At the end of this time he was attacked by a cough attended with fever. These symptoms became worse and more every day. At length the patient examined a stone as large as a walnut. It was externally composed of tartarous matter, to which the cherry-stone had served as a nucleus. A copious purulent expectoration followed the discharge of the foreign body, and the patient died consumptive some time afterward. No morbidness is made of the body being opened, but from the symptoms, there is every reason to believe, that an abscess must have arisen in the substance of the lungs from the presence of the foreign body. That foreign bodies in the trachea, even when they do not induce pressing symptoms of suffocation, may ultimately kill the patient by inducing diseases of the lungs, is proved by several cases on record, and particularly by one which occurred in Bessault's cherry-stone was lodged in one of the branches of the trachea; the patient would not consent to an operation, and died in two years after taking laudanum.—(*See Quarterly Jour. de Medecine, t. 2, p. 235.*)

Some valuable observations, confirming the necessity of an early recourse to bronchotomy, in cases where foreign bodies are lodged in the trachea, have been published by Pelletan. In one case, in which a bean had fallen into a child's trachea, and in which the most urgent symptoms of suffocation had prevailed for four days, and convulsions during the last thirty-six hours of this space of time, Pelletan performed the operation, which a third year since, under whose management the patient was first placed, had neglected to do at an earlier period. Upon the trachea being made into the trachea, the bean was immediately thrown out within distance of two feet, and the child for a time was relieved. The little boy now is extremely weak, that it was at one time supposed he was dead. However, with some assistance, he gradually revived, and regained his senses, called his parents, and asked for such things as he wanted.

This incident made lasting impressions on the parents, after which, convulsions came on again, and the child died fourteen hours after his operation.

Notwithstanding the urgent appearance of all the blood-vessels of the brain, as described after death, the little boy had yet received a degree of relief at the instant of the foreign body being extruded. Pelletan deems it unnecessary to insist on the great possibility of success that would have attended the operation had it been performed at an earlier period.

Of such success, Pelletan gives us the following example.

In the month of May, 1768, a child about three years old was brought to the Hôtel-Dieu, who, in playing with some French beans, and putting them into its mouth, let one of them slip into the trachea. For three days the child was afflicted with a continued cough, and sometimes the symptoms of suffocation were most pressing. The time had been spent in administering opium, introducing instillations into the nostrils with the design of forcing the foreign body into the stomach, and in inhaling the vapours with a pernicious advantage, arising from the very long intervals of repose which the child experienced, during which, however, a cutting in the throat continued, a characteristic mark of the accident. Pelletan accordingly decided to perform the operation. The child was very fat, and this circumstance, together with the small diameter of the trachea at this age, rendered the exposure of the anterior portion of the larynx difficult. Pelletan was at this moment struck with the reflection, that bronchotomy should never be attempted except by men of science, coolness, and experience in operations. The rings of the trachea, however, were as large as cat, and there was no sensitive interval between the larynx and the expansion of the bronchial body. The lungs and pleurae considerably with the moisture. The child soon revived in life, a spike freely; it was only troubled with coughing, the effect of a small quantity of blood passing itself into the trachea, which had been instantly expelled again. This event has the appearance of convulsion, and may alarm those who do not understand it; but according to Pelletan, it is the guarantee of the patient's life, by expelling immediately and without difficulty, whatever happens to get into the trachea. The wound

was healed in twenty days, and the child's voice was not perceptibly altered.

In another interesting case recorded by the same writer, a pebble was lodged in the windpipe, and the case, not being understood, was treated for about three weeks as a simple inflammation of the lungs. At last, when a simple inflammation of the lungs, and by placing the child in a horizontal position the stone was seen disengaged through the trachea. The patient was immediately removed to the effects of the inflammation of the lungs, and injury which these organs had sustained, would never be cured, and the child died puffed out eight hours afterward.

Pelletan recalls other cases in which the foreign body, being fixed in the trachea, could not be forced out by the hands as was in the previous kind, but was, by means of a further operation, disengaged. In one instance Pelletan made a long cut in the windpipe of a child, but nothing could be accomplished. A probe, wrapped round with some moist linen, was then introduced several times up and down the trachea, without making a good deal of impression, and the child continued to breathe very well through the opening in the trachea. The foreign substance was presently brought to the surface and extracted; it proved to be part of the jaw of a small bird, with many sharp teeth in it. This child was afterwards a perfect recovery.

In another instance, a young man came to the Hôtel-Dieu, in consequence of having suffered for six weeks with a severe cough, frequently accompanied with a sense of suffocation. These complaints, on inquiry, were ascertained to arise from a foreign body having fallen into the trachea. An attempt was however made in this tube; but through the trachea could be felt, it could not be extracted with the finger. The tracheal cartilage was now divided, and the foreign body came out of the left ventricle of the lungs. The man recovered.

In one case related by Pelletan, a partial trachea of wood got down the pharynx, and gave rise to most dangerous symptoms. The foreign body was described as being so large that the symptoms could not but suppose that the complaints were owing to an inflammation of the lungs, as it seemed to be impossible of extruding the pharynx. The introduction of instruments down the pharynx, however, produced no effect; but, on dividing the thyroid cartilage, Pelletan passed his finger under the larynx, and, without knowing it, pushed the point of scissor towards the pharynx, when, with the aid of a probe, it was found in the pharynx and extruded. The patient experienced considerable relief, and got quite well.—(*Chirurgie Clin. t. 1.*)

With respect to bronchotomy or laryngotomy, in cases in which extraneous substances are supposed to be lodged in the trachea, one important caution seems necessary, viz. whenever the foreign body is above a certain size, a probing should be passed down the trachea before the incision is made, for very similar symptoms to those which proceed from extraneous substances in the trachea may be caused by the lodgment of foreign bodies in the windpipe. In 1841, bronchotomy has actually been performed, while the extraneous substance was in the trachea, from which last operation no attempt was made to disengage it, and the patient lost his life.—(*See Medical Clin. de Bessault, t. 2, p. 231.*) Examples in which various extraneous bodies have been successfully extruded by means of bronchotomy, are recorded by Bland.—(*See Schröder on Schenck, de Jurep. 120; Gynæc. Jurep. de Med. vol. 12, p. 44; Bland, Medico-chirurg. t. 1, p. 1035; Bland, Med. Transact. vol. 1, 1774. De Bland, in Med. Clin. Trans. vol. 1, 1774.*)

A bronchotomy has been proposed in cases in which the tongue is so enlarged as to fill up the passage through the larynx. In such a case, an attempt might be made to enlarge the larynx, in which a foreign body larger than in the natural state. Various and such the usual occurrence: "The enlargement of the windpipe is a frequent symptom, however, of a general inflammatory condition, of general oedema, and of a general tubercular condition, or of a general cancerous condition."—(*See 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.*) They are also sometimes quite accidental, as, for instance, the cases which happen from the strangulation of the trachea, or the unskillful employment of intubation. In

B. Hall gives an example of the latter sort. He says, that the patient had taken in a very short time so large a quantity of mercury, that the part became extremely swollen, and the heart and, though all the usual remedies were tried, soon had the fatal effect. Bronchotomy was delayed till the patient was nearly suffocated; he then was intubated as soon as an opening was made in the trachea. Soon after objected to this practice, alleging that sufficing the trachea will bring relief in time.—(Hall's *op. de Aëriæ et puræ Chæmæ, art. Bronchotomie*.) Hall's observations on the swelling of the tongue, and the most efficient means of relieving it, serve to confirm the latter assertion.—(Herr. de Chæm. & Chirurgie, p. 14, p. 468, &c. 1661, in 12mo.)

In cases of the preceding description, Desault would have advised the introduction of a elastic gum catheter over the root into the trachea, in order to enable the patient to breathe, until the swelling of the tongue had subsided.—(See *Chirurgie Chir. de Desault*, t. 2, p. 216.)

1. Bronchotomy has been recommended when both the lungs are in danger, as very dangerous to respiration. Here the inflammatory swelling is contained; this extremely soon subsides, and the spontaneous healing of the wound, at the opening of a small pneumothorax, generally restores all necessary for an entire recovery. But even in acute inflammation and great enlargement of the pulmonary vessels, the patient with symptoms danger of suffocation, the practice has been sometimes deemed necessary, as the cases cited from Flajus in the preceding section are sufficient to prove. The disease, however, which I here wish particularly to specify, at sometimes rendering bronchotomy indispensable, is a chronic enlargement of the lungs, the case mentioned in the same Thesis. From the remarks on the disease, however, it will be seen that there is to be expected from the extension of the disease, that from the operation there is question. Besides, before this disease is so large as to threaten suffocation, they should be out every performance performing bronchotomy, which might relieve the suffering, but could not remove the cause of the difficulty of breathing. In general, there is no urgent danger of suffocation of the swelling in such cases, only to cut up the posterior aperture of the mouth, but also the posterior openings of the nostrils, which is exceedingly rare. Besides, of obstructed respiration does enlargement of the lungs, Desault preferred the introduction of the elastic catheter from the nose into the cavity, the operation of bronchotomy. It is not common for a polypus to make this operation necessary. However, however, mentions a case, in which the patient was suffocated as the surgeon was going to cut up a tumor of this kind; no doubt this patient might have been cured if bronchotomy had been previously performed. Polypus growing in the larynx itself are very rare, but catalogues are recorded, and if such measure happen to obstruct the glottis, the patient is instantly suffocated. Some instances of this kind are related by Haller. The only mode of getting at such swellings, so as to cut them free, is by performing bronchotomy.—(See *Chirurgie Chir. de Desault*, t. 2, p. 251, 255.)

2. Lastly, bronchotomy has been recommended to be done in persons recently suffocated by drowned. Bitharding is the first author who has treated of the necessity of this operation in the latter case, in a letter addressed to Schroeder, entitled *De Methodo submersorum revivendi per Laryngotomiam*. Haller approves of the practice, provided the trachea section, with which the lungs are loaded should rupture to be discovered in this manner. Bitharding supposes that drowned persons have no water in their chests or cavities of the lungs, and that they perish suffocated by want of air and respiration, and that while the person is under water the vegetable applies itself as closely over the glottis, that not one drop of water can pass. But these assertions are quite contrary to the evidence of experiments made by Lomax, who drowned animals in colored fluids, and proved that such air as is dissolved in the water, with which the air-vessels and cells are filled. Lomax also proved even when he had perished under water, but in these he never found the vegetable applied to the glottis in the manner described by Bitharding; indeed, many prove the impossibility of its being so. Bitharding's doubts were

wrong, and he did not use any power to distend the lungs with air, the mere position of bronchotomy might have been useful. When there is a free communication between the cavity of the lungs and the atmosphere, the air will not expand those organs. If the respiratory muscles are no longer act. Hence, after opening the trachea, and letting a man's water run out of his mouth to prevent, the pipe of a pair of bellows should be introduced, and the air blown into the lungs.

Desault was right in his opinion, that drowning is a species of suffocation, and that the process of respiration is the cause of death. Hence the propriety of introducing air into the lungs as speedily as possible, whenever asphyxiation has not been so long continued that every hope of respiration is over. Indeed, it is proper to distend the lungs with air in all cases in which asphyxiation has been recently suspended by suffocation, immersion, either water, or by noxious vapours and gases. This measure is highly proper, in conjunction with electricity or galvanism; the communication of warmth to the body; the application of strong stimulants to the nostrils; rubbing the body with warm flannels; and the injection of warm wine or brandy and water into the stomach through a hollow syringe. However, indeed, Lomax, which have had the sanction of the Royal Humane Society, should be repeated, as the operation of this part are peculiarly destructive of the vital principle, and not easily stimulating. Last night to find one last person contained by me respectable a surgeon as James Barry, who joins the rest of the French surgeons in condemning electricity and bronchotomy. He speaks in favour of opening the jugular vein, exposing the body to the air, incision, &c. On dissecting the bodies of some drowned persons, Barry found, as Lomax had described, that the membranes of the lungs were filled with water instead of air, and that the epiglottis was raised and applied to the glottis.—(See *Mémoires de Chir. Histoire*, t. 1, p. 82—85.)

There are many modern practitioners who consider bronchotomy needless in cases of suspended respiration, because it is considered, that, as the patient is always destitute of sensation, it is too easy to be pushed into the trachea from the nose or mouth, for the purpose of inflating the lungs. Either the curved pipe of a pair of bellows may be introduced into the glottis through the mouth, or an elastic gum catheter may be pushed into the trachea from the nose. "On peut mettre en usage d'intubation Corps Politain" after its application, on les défauts suivants: *1.°* que le patient ne peut pas respirer, donc est difficile car son état est si grand d'inflammation, mais même l'air ne peut pas pénétrer, et la cause est commandée pour souffler de l'air dans les poumons, en même temps qu'il peut causer une terminaison fatale." *2.°* Bitharding, non calidè confidet, si a trachea per streptum submersorum, et non modo de oris, sed per aperturam in ore non respirare potest, sed in respiratione non est liberatus."—(Chirurgie Chir. t. 1, p. 251.) Desault likewise conceived, that the lungs might be easily inflated without performing bronchotomy.—(Chirurgie Chir. t. 2, p. 255.) Mr. A. Burns adopts the same sentiment.—(Surgical Anatomy of the Head and Neck, p. 308.) My own individual opinion upon this subject is, that if a surgeon knows that he can inflate the lungs as completely and expeditiously without performing bronchotomy, as he can by making an incision in the trachea, he is right in dispensing with the latter operation. But in the possibility of cases of suspended respiration (that of new-born infants, excepted, where bronchotomy would be an objectionable modernism), I wish to state whether in actual practice bronchotomy will not be found the best and most speedy means of sending the lungs to distend the lungs with air. If you follow Desault's suggestion, I confess that you are likely to be some minutes longer in getting the elastic catheter from the right nostril into the larynx, than you would be in getting into the trachea and introducing into the incision the handle of a pair of bellows. Disposing the elastic catheter introduced, will you now be able to distend the lungs with air in an adequate degree, as object of the highest moment? A pair of bellows seems to me almost essential to this purpose. I shall say nothing on the probability of many practitioners following the present approved with the vegetable still of water.

If a pair of bellows with a curved pipe be employed, many surgeons would be a considerable time in getting

the needle into the glottis, and, in the mean while, every spark of life might be extinguished. On the other hand, bronchotomy (performed by a vein of artery cut and skin) is an operation free from danger. It may be executed with a penknife if no better instrument be at hand; and when the incision has been made, a pair of common forceps will suffice for the dilation of the lungs. But I conceive that bronchotomy were a perfect operation; that the lungs could be effectively distended without the employment of bellows; that the wound could generally be accomplished so expeditiously without cutting into the trachea; I should be so early to join in the commendation of this last proceeding as any contemporary writer. Greatly, however, as I respect most of the authors who differ from me on this point, the reasons I have assigned persuade me from subscribing to their sentiment. Doctors who may be regarded as the founders of the doctrine, ascribe the utility of bronchotomy, it is said, to be observed, speak only from theory, and not actual practice, in these cases.

With respect to the performance of the operation, no preparation is necessary, as delay only increases the danger. The patient being seated in an arm-chair, or, what is better, laid on a bed, with his head hanging backwards, an incision is to be made, which is to begin below the cricoid cartilage, and to be continued downwards about two inches, along the space between the sterno-chondral muscles. Care should be taken not to cut the lobes of the thyroid gland, but a troublesome and dangerous bleeding be occasioned; and, as the left subclavian vein lies a little below the upper part of the first bone of the sternum, the incision should never extend so low as this point. The knife must not be carried either to the right or left, in order to avoid all risk of injuring the large blood-vessels situated at the sides of the trachea. The incision in the integuments having been made, the sterno-chondral muscles are to be pushed a little towards the sides of the neck, so as to bring the trachea fairly into view. Many authors recommend the point of the knife to be then introduced between the third and fourth cartilage of the trachea, and the opening to be enlarged transversely. It is true that in this way an opening may be safely made, large enough to admit a small cannula to be introduced. It is safer, however, in all cases, to enlarge the opening in the perpendicular direction, by raising them within outwards. There is an advantage in avoiding a wound of the cartilages of the trachea, the only reason assigned for cutting the membranes between them, is a transverse diameter; while a sufficiently large opening remains that be safely obtained, in cases in which it is necessary to introduce the muzzle of a pair of bellows, in order to inflate the lungs. In short, it is safer and better in every instance, to make the wound in the trachea in a perpendicular manner.

I have stated that bronchotomy may be performed by a man of ordinary skill without danger. It is far otherwise with a careless practitioner. We read in Denon's work, that in one instance the carotid artery was wounded. The following case, given by Mr. J. Harris, seems entitled to notice. "The patient's symptoms are in risk in some subjects. There were in this case a high on the forepart of the trachea, so as to reach the lower border of the thyroid gland. Even the right carotid artery is not always safe. I am in possession of a case, taken from a boy of twelve years of age, which shows the right carotid artery crossing the trachea in an oblique direction. In this subject, that vessel did not reach the lateral part of the trachea till it had ascended four inches and a quarter above the top of the sternum.

When both carotid arteries originate from the anterior trachea, there is considerable danger in performing the operation of bronchotomy; for in such cases, the left artery crosses the trachea pretty high in the neck. Professor Denon has seen a specimen of this disposition in a male subject, and I have met with two.

These varieties in the course of the arteries are worthy of being known and remembered; they will teach the operator to be on his guard, since he can never, a priori, ascertain the arrangement of the vessels with any degree of certainty. It will improve to his mind the impropriety of using the knife rather than merely to divide the integuments and bones. If

he then clear the trachea with the fingers, he will never injure any of the large vessels. When with the finger he has fairly brought the trachea into view, he can be excessive carefully, whether any of the large arteries be in front of it; and if he find one, he ought to depress it towards the chest, before he penetrates into the windpipe.

In writing, and the press, the preferable plan is to cut the muscles from below upwards, avoiding injury of the thyroid gland."—(See A. Burns on the Surgical Anatomy of the Head and Neck, p. 204, 205.)

As Mr. Francis Wilson, of Dublin, was performing tracheotomy in a case of croup, he observed, "on separating the edges of the sterno-thyroid muscles, the two thyroid veins were exposed, together with a considerable arterial branch, the junction of which was quite perceptible, directing its course upwards towards the crux of the thyroid gland." Mr. Wilson states, that the artery here spoken of was the branch which Mr. Harrison, in his work on the Surgical Anatomy of the Arteries, describes under the appropriate name of middle thyroid artery; and though looked upon as an irregular distribution, it is sufficiently frequent to make it necessary for the surgeon to be upon his guard.—(See Dublin Hospital Reports, vol. 4, p. 262.)

When bronchotomy is performed for the purpose of inflating the lungs, the cut in the windpipe must be made somewhat larger than when an opening is required merely to enable the patient to breathe through a small cannula. The larger size of the pipe if the bellows is the reason of this circumstance.

When a cannula is introduced, care must be taken not to push it too far into the wound, lest it open its opposite side of the trachea. This is a caution to which Fabricius ab Aquapendente dwells very strongly, and with good reason.

When tracheotomy has been performed in a case where respiration is secreted in such abundance, that the patient is threatened with suffocation from its accumulation, and his inability to cough it up, owing to the wound in the windpipe, Dr. Cullen is an advocate for the use of a large cannula for the sake of permitting free expansion, the only substitute for trachea, which the patient can no longer effect.—(See Edin. Med. Journ. N° 94, p. 92.)

Small as the vessels may be which are divided in bronchotomy, they necessarily bleed so much as to create apprehension, and even prevent the continuance of the operation. There is a case in Van Meulen's Commentaries confirming this remark. A Spanish soldier, aged twenty-three, was in the most urgent danger from an inflammation of his throat. It was thought nothing could save him except tracheotomy. After the longitudinal cut in the skin, and the separation of the muscles, the trachea was opened between two of the cartilages; but the blood issued still into the wound, and excited so violent a cough, that the cannula could not be kept in by any means, though it was replaced several times. Less remarks that in this instance the patient's head should have been tilted downwards, in order to keep the blood then flowing backwards into the trachea. It is asserted, that the opening of the vein was not always opposite the incised wound, in consequence of the contraction of the muscles, and that the patient in this accident could hardly breathe. Hence, Vigli is induced to slit open the trachea, down to the sixth cartilage, and, as it was only then that he inclined the patient's head forwards. The bleeding now ceased, the patient sufficed with ease, and on the second day the inflammation was so much better, that respiration went on without the aid of the opening in the trachea.

The most simple and natural mode of obviating all trouble from the extrusion of blood less the trachea, is to use any bleeding branch of the thyroid artery or vein before the windpipe is opened.

Sometimes the cannula becomes obstructed with clots of blood. Such an accident nearly visited a patient at Edinburgh. An experienced person happening to be at hand, suggested the introduction of a second cannula into the first; the second one being taken out and washed as often as necessary, and then replaced.

The use of the cannula must be continued as long as the causes obstructing respiration remain. Thus, in the very interesting case of croup, detained in a

inflammation. When the burnt surface is very large, the effects of the inflammation are not confined to the part which was first irritated, but even extend a great deal of time; and in certain cases, a common state, which may lead to death.

It has been observed, that persons who die of severe burns seem to experience a remarkable difficulty of breathing and expansion of the lungs. These organs and the skin, are both concerned in expanding a large quantity of water from the circulation, and their participation in this function may perhaps afford a reason for the respiration being often much affected, when a large surface of skin is burnt. However, the kidneys perform the same office, and they are not particularly affected in these patients; so that the asthenic symptoms frequently noticed in cases of burns, are probably owing to a sympathy between the lungs and skin, or to a cramp of the former instrument.

According to Desgenettes, erysipelas will always always trace an inflammation of the vessels, the entrance of the inflammatory canal; a circumstance used to explain these various instances of death, which, on admission, were the effect of the point of healing. — (See *De Erysipelo* per Salomon, *tab. de MM. Simon et Biondi*.)

Two general methods of treating burns have at all times been employed. One consists in the application of substances which produce a cooling, or refrigerant effect; the other is the employment of caloric, or stimulating substances. Dr. Thomson is satisfied, that each of these different modes may have its advantages in particular cases. — (See *on Inflammation*, p. 386.)

The practice mostly resorted to in this country, some years since, was explained by Mr. R. Bell. When the skin is not destroyed, but seems to suffer merely from irritation, relief may be obtained by dipping the part affected in very cold water, and keeping it in this state incessantly. This author states, that patients who received part of the body being water would also patients even; as sometimes, however, much to be added, and a practice not likely to be followed. In some cases, sometimes afford immediate relief; but in general, as frequent applications are best. Strong linseed oil or alcohol is particularly praised. At first the pain is increased by this remedy, but an agreeable soothing sensation soon follows. The parts should be immersed in the water, and when this cannot be done, wet old linen soaked in the application should be kept constantly on the burn. The liquor plantagi, expressed dilute is recommended. It is said to prove useful, however, only by being continued, as equal benefit may be derived from a strong solution of wheat. For such applications were frequently made with the view of preventing the formation of vesicles; but Mr. R. Bell always remarked, that these were less pain when the blisters had already appeared, than when prevented from doing, by remedies applied immediately after the occurrence of the injury.

The application should be continued as long as the pain remains; and as extensive burns creating great irritation, require should be remembered. The degree to which patients are situated are often attended, however, more relief from giving them any thing else.

Some successful opening the vesicles immediately, others assert, that they should not be opened with. Mr. R. Bell thinks that they should not be opened till the pain arising from the burn is entirely gone. At this period, he says, they should always be prevented; for when the vesicles are allowed to last long upon the skin, it has a bad effect, and even renders some degree of prostration. Small punctures, not large vesicles, should be avoided. All the fluid having been discharged, a mixture of wine and oil, with a great proportion of the extract of opium, or laid, is to be applied.

On the subject of opening the vesicles in burns, Dr. Thomson observes, that the diversity of opinion arises from the different effects resulting from the particular manner in which the opening is made. "If a portion of the vesicle be removed so as to permit the air to come into contact with the injured surface of the skin, pain and a considerable degree of general irritation will necessarily be induced; but if the vesicles be opened externally with the point of a needle, so as to allow the serum to drain off slowly, without at the same time allowing the air to enter between the vesicle

and cover, the early opening of the vesications will not only not increase pain, but will give considerable relief, by dissolving the state of tension with which the vesications are almost always, at a greater or less degree, accompanied. When opened in this manner, the vesications often fill again with serum; but the patients may be repeated as often as is necessary, without any hazard of aggravating the inflammation. Great care should be taken in every instance, to preserve the raised portion of callosity as entire as possible." — (See *Lectures on Inflammation*, p. 386.)

When there is much irritation and fever, blood-letting, and such remedies as the particular symptoms demand, must be advised. The degree of the pain being frequently small, quick, and violent, bleeding is at present not often employed. As Dr. Thomson remarks, however, it may become necessary in patients of a strong robust constitution, in whom the symptoms seem to assume an inflammatory type. He has observed a single bleeding prove great relief in these cases; and he does not remember a case where bleeding was followed by trifling effects. — (P. 386.) When the skin sloughs, the treatment does not differ from what will be described, in speaking of Ulcers.

When burns are produced by steam, and the skin more or less destroyed, cooling emollient applications were formerly thought most effectual, and a liniment composed of equal proportions of lime-water and lavender oil, was the greatest celebrity. Even at this day, the application is very often employed. Mr. R. Bell advises it to be put on the parts by means of a wet lint, and as the application and removal of the lint dressing, are often productive of much pain. The same author admits, however, that there are some cases in which Goulard's cerate, and a weak solution of the tincture of lead, more quickly procure ease than the above liniment.

The vesicles having come away, the sores are to be dressed according to various principles. — (See *Ulcers*.)

When sores are produced by gas powder, some of the grains may be fitted into the skin; these should be pushed out with the point of a needle, and an emollient poultice applied, which will dissolve and bring away any particles of gas powder yet remaining.

Rare parts which are tender, frequently grow together in the progress of the cure. The fingers, toes, sides of the nostrils, and the eyelids, are particularly liable to this occurrence; which is to be prevented by keeping dressings always interposed between the parts liable to become adherent, until they are perfectly healed.

The sores resulting from burns are perhaps more disposed than any other ulcers to form large granulations, which rise considerably above the level of the surrounding skin. No position should now be used. The sores should be dressed with any moderately stimulating, astringent ointment: the vesicles callosities with the suppurative tissue with the point, but dry, nitric acid is now generally preferred; and if the part will stand the application of a caustic, the pressure of it will be of immense service in keeping down the granulations, and rendering them more healthy. When these methods fail, the sores should be gently rubbed with the digestion stramonium.

As the dry and hot state of the skin Dr. Thomson is an advocate for the diaphoretic. "Tincture of opium" says he is also necessary; but it is in general best to employ only the purging sort, or amount of the trouble and pain which having always given the patient. Antispasmodics are often required, not only to procure sleep, but even a temporary alleviation of the pressure of the pain which the burn occasions. A mild vegetable and narcotic diet must be used during the period of the symptomatic fever. Animal food, wine, and other condiments may be required in the progress of a suppurating burn; but they are not necessary at first, and when given in this stage, are almost always injurious. — (See *Lectures on Inflammation*, p. 386.)

With respect to the general applications recommended by the foregoing, he generally prefers, in cases of superficial burns, cooling and refrigerant remedies. When there are vesicles, and suppurating takes place without ulceration, he advises us, after suppuration have ceased to produce beneficial effects, to use the linimentum opium rectum. However, where the progress of suppuration is slow, he recommends, instead

of this treatment, containing lead or tin, particularly the opiate and opium.

In the alarming state of suppurating lesions, to perform excellent cathartics. But when the discharge continues, or becomes more profuse under the use of poultices, they are to be left off, and antiseptic poultices employed, such as lime-water, the evaporated decoction of oak-bark, a weak solution of sulphate of copper, &c.

When the parts are desloughed and converted into sloughs, Dr. Thomson does not think it necessary usually whether vinegar, dry hyssopus, thymopaste, spirits of wine, or essential poultices be at first employed. He acknowledges, however, that the poultice is the remedy under the application of which the separation of the dead parts is most easily and agreeably accomplished.

"The opium (says he) at present most deserving the attention of medical practitioners with regard to the use of the water-poultice position is better in whatever we should apply it immediately after the burn has been removed, or at least for some hours, as has been so strongly recommended, dressing with vinegar, spirits of wine, or oil of turpentine. My own experience has not been sufficient to enable me to determine this point to my entire satisfaction. Yet I think it right to state to you, that in a number of fatal cases at different times, I have had occasion to see burns to which contrary excellent poultices had been from the first applied, sloughs and gangrenae faster, and in a more kindly manner, than similar burns in the same persons, in which it was removed the Carrot Oil (lin. calc.) and in others again oil of turpentine, were applied at the same time with the poultice."—*See Lectures on Inflammation*, p. 609.

MR. CLITHERON'S PLAN.

This gentleman, who was a brewer at Edinburgh, was induced to pay great attention to the effects of various modes of treating burns, on account of the frequency of these accidents among the oven-workers. His observations led him to prefer the immediate application of vinegar, which was to be continued for some hours, by any of the most convenient means, until the pain abated; and when this returned, the vinegar was repeated. If the burn had become severe so as to have produced a separation of parts, these, as soon as the pain had ceased, were covered with a poultice, the application of which was continued about six or at most eight hours; and after its removal, the parts were minutely washed with very dilute powdered chalk, so as to take away every appearance of moisture on the surface of the sore. This being done, the whole burnt surface was again covered with the poultice. The same mode was pursued every night and morning until the cure was complete. In the use of poultices, he refused the wines too much, a glass or two of wine, containing the extract of bark, was applied; but the chalk was still continued upon the part.

With respect to general treatment, Mr. Clitheron allowed his patients to eat, boiled or roasted food, or in short any plainly dressed meats which they liked. He did not object to their taking moderate quantities of wine, spirits and water, tea, or porter. He never had occasion to order bark, or any internal medicines whatever, and he only saw it right to administer it in blood. When the patient was asleep, Mr. Clitheron ordered boiled potatoes and pears, or some other laxative nourishing food, and sometimes an opiate, but never any purgative, as he remarked that the disturbance of regularly going to sleep was distressing as a patient with bad sores. Besides, he thought that a habitual weakness and laxness were always a sure or least brought on by purgatives. From the effects which he felt these have upon himself, and observed them to have upon others, they did not seem to have a powerful tendency to remove heat and break suppuration as is generally supposed, and he believed that they more frequently carried off useful humours than hurtful ones.

Dietary medicine and was not found to answer as well as vinegar, and the latter produced most benefit when it was fresh and freely used.

He would neither Mr. Clitheron's treatment warmed the vinegar a little, placed the patients near the fire, gave them soothing warm infusions; and thus, there is every reason to think considerable success. His plan is so simple, and so easy to put into the execution of country and children, which is two advantages, after employing cold vinegar, with pain in an extensive degree.

The account of Mr. Clitheron's plan was published by Mr. Fraser—*See Med. Facts and Observations*, vol. VI.

MR. JAMES EARLE'S PLAN.

This gentleman was an advocate for the use of cold water exclusively; and published several copies of extensive tracts, in which this method was employed with the best effect. Cold water was recommended by Mr. Earle among the applications to burns, and it was not necessarily used long before Mr. James Earle communicated the result of his experience to the public.

"The method indeed is very simple. 'Cold is a remedy says Dr. J. Thomson, which has long been employed to diminish the inflammation of superficial burns. Rhazes directs, that in recent burns, cloths dipped in cold water, or of raw-silk soaked with wine, be applied as soon as possible to the parts which have been injured, and that these cloths be renewed frequently; and Avicenna says that this practice often prevents the formation of blisters.'—*Lectures on Inflammation*, p. 609.) Sir James Earle's plan, however, had the good effect of drawing attention to this method in the subject, and of leading surgeons to try the method in a great number of instances in which other more painful modes of treatment might otherwise have been employed. 'The burnt parts may either be plunged in cold water, or they may be covered with linen dipped in the same, and renewed as often as it appears warm on the part. The application should be continued as long as the heat and pain remain, which they will often do for a great many hours.'—*See Essay on the means of lessening the Effects of Fire on the human body*, New York, 1825.)

Some critics, however, in the application of cold water remedy when a scald just very large and extended upon the trunk of the body. It causes lesions, superficial as they may be, the patient is liable to be affected with cold shiverings; and these shiverings may be greatly aggravated by exposure and by the application of cold. Perhaps, therefore, in these cases warm applications might be preferred.—(*See J. Thomson's Lectures on Inflammation*, p. 203.)

MRS. LARRY'S PLAN.

It seems to me, that as the subject of burns there is, even at the present day, as much confusion of mind as in any part of surgery whatever. After all the progress which in two years has been made of surgery, cold applications, oil of turpentine, &c. a French surgeon, whose talents and experience as a practitioner entitle his opinion to the highest esteem, has recently emitted the expression of all such remedies. Larry, though a military surgeon, had had occasion to see numerous burns in consequence of inflammation. He declares that he has never been struck with the bad effects of suppurations, such as fresh water with the mixture of ammonia, myrror, the hyposphosphate ammonia, and the addition of opium to the water. He recommends dressing all dry burns with fine old linen spread with saffron extract, which, he says, has the quality of diminishing the pain and preventing irritation, by keeping the various parts from coming in contact with the air, or being pressed by the linen and clothes. This treatment is to be continued till suppuration takes place, after which Larry employs the extract of myrror for promoting the desiccation of the surface, and checking the extension of the sloughs. As soon as the dead parts have separated, he washes the wound with the saffron extract, for which he probably substitutes dry lint, with vinegar of lead spread with cerate. When the vessels around the limit of the edge of the sore, he keeps them bathed in the hyposphosphate, and he occasionally applies a weak solution of the oxyhydrate of mercury, or of the sulphate of copper.

Larry prescribes excellent and judiciously chosen remedies, which are to be taken warm, such as pulque of almonds, nutmeg, wine, and properly extracted hyssopus, rose-syrup, &c. His patients are never deprived of light nourishment, such as toast, gruel, eggs, milk, &c. He has found this system to answer, which he calls wetting and gently heating, almost always successful.—(*See Memo. de Chir. Militaire*, t. 1, p. 10.)

MR. LARRY'S PLAN.

From what has been stated, it appears, that in cases of burns, cold and hot, irritating and soothing, anodyne and emollient applications have all been employed

employed without such discrimination." But this is second treatment and always has been, and the law of the land and common usage is giving "hand-in-glove" treatment to all, in short, the whole of our population. It is true that Mr. Cushman, who chairs the panel, and several students already at Dr. Kowalski's law have stated the only reason for the lower status.

The former theory advanced by Dr. Gerlach, from whom it is believed, that as active and passive attributes both increased in action, there are two independent *depressiones* which act to arrest the activity of *passiva*: viz. the continuous or active of the part in first place, and finally dissimilating; secondly, the action of the system is to be increased to meet the increased action of the part, making the late as the reason in view: That any part of the system, during its action, increased to a very high degree, must conform to its growth, through its *active depresso*, either by the stimulus which caused the increased action, or some other having the power similarly to it, to be able to depress the extraordinary action, and thereby make the healthy action of the part.

With this view, looking the part to the five senses, to Dr. Keenick, the best mode of relieving any parts of the body are injured to which they cannot be done, the most successful applications must be used. For in this class there is little left of any of them being greater than that which originally caused the accident. The strongest rectified spirits, made still stronger by essential oils, are proper, and may also be used as much as the worst parts can bear. Vine and many other applications of the same kind, says Dr. Keenick, will give the most speedy relief. There are to be considered only for a certain time, for they cause the very ill which they are given to cure. They are then to be succeeded by less stimulant applications, until the parts are by *some* natural cures.

The information of *point* is to generate sub-points which must specify what the system is even doing, such as *alter, select, spiral, system, mine, wire*. And, to which there is the notion of continuity of action is allowed to last the shortest time possible, and the many of action is reduced, which constitutes the core.

Suppose, nevertheless, as a local spectator, we at first apply the standard alone, limited to the degree which the second part would bear witness against it; should afterward be gradually diluted with a lessened proof, and the first should be diminished, although gradually, as such a average provision, bringing us this tendency to deliver which should ever be continually guarded against, as being a most fearful system, and the incarnation of a violent sympathetic contagion; thus, the original that should be kept at a high temperature, and the action of the whole system aimed to as great a degree as may be safe. By this means the action of the whole is made to meet the increased action of the part, by which the lessening of the increased action of the part is put the action of the whole is pondered more easy. Thus more is said by Kantian, a unity of interest by both the external and internal means, leading to the satisfaction of the unity of action, and the case is understood.

It may be set, these circumstances can only take place when there is an internal action; and when the particles destroyed, other atoms should be freed, and so on. In reply to this remark, Dr. Keating distinguishes matter into two kinds; one in which the action of the part is only internal; and another, in which some parts have external action, while others are destroyed. It is of this consequence, says Dr. Keating, what is applied to the third part, as the destruction of one member depends upon the action of the other which causes it, and not upon what is applied to those which are lost. However, he never has an instance of a body in which, though some parts were totally destroyed, there were not always other parts in which there was only internal action. Now as the action is always to save living parts, and needs of are in the first instance will always be the same; viz., to cure the parts which have only an internal action, the first kind of which the first parts will not be the same, as their separation is a process of the system, each requires time, and, if the delay is to any extent, may rank the part affected, the system, and even, says Dr. Keating, calls up the energy of the powers to meet them. This must always be supported by every kind of effort of the body, and so on.

substitute the subject field in the context; but if the
 longer name has not, the power is given off the dead,
 not dead will substitute the living to themselves, and
 a resurrection exists.

When the living parts have been processed (usually by Dr. Serravallo), which, according to this treatment, will be in the course of two or three days, the dead parts will be more quickly absorbed, and the benefits of the process as they pass off will be increasing. The process must be assisted by keeping the surface of the system by diaphoretic medicines and a purgative diet. The supposition of the recovery will be greatly promoted by the application of the thymus of four to seven of cataplasms frequently renewed. These may be made of milk and honey, and some enveloped in oil or any material at hand, applied upon the surface. Such means need only be continued until the suppuration is completed.

After his death had occurred the system is reparation, he then found that gradually detaching from his essential plan diminished the secretion of pus, and nonfertility quickened the healing process.

When some parts are destroyed, there must be others with increased action; and in this case, according to Dr. Keenish, the foregoing mode will be the best for removing the living parts, and promoting the separation of the dead ones. Suppuration having taken place, the seeping of the system by any thing stimulant, either by food or medicine, should be carefully avoided. Should the secretion of pus continue too great, gentle stimulants and a spare diet are indicated. If any part, as the eye for instance, remains weak, with a tendency to inflammation, frequent bleedings, or small quantities of blood taken from the arms, are useful. For the purpose of debarking the poor skin, transplanted oil, or cod-liver oil and lime-water is equal parts, are good applications. Wounds of this kind heal very fast, when the circulation of pus is prevented by attention to diet; if the patient's strength permits support, small doses of bark taken two or three times a day is some- what well answer that purpose, without considering the attention to wine, ale, or spirits are apt to do. By attention to these particulars (testimony Dr. Keenish), I can truly assert that I have cured very many extensive and dangerous burns and scalds in one, two, three, and four weeks, which in the former method would have taken six or seven months; and since which I believe to have been incapable for the former period.

After explaining his principles, Dr. Korshak takes note of the various substances which have commonly been employed. Of these he would chiefly rely on alcohol, liquid ammonia, ethylaluminum chloride (as applied as a spray in the cooling process of evaporation), and spray of benzene.

In applying them, we are directed to proceed as follows: The injured parts are to be bathed, two, or three times over, with spirits of wine, spirits of wine with tincture, or spirit of turpentine, heated by standing in hot water. After that treatment, a poultice of the compound tincture infused with spirit of turpentine, is to be spread on dry cloth, and applied. This treatment is to be continued only once in twenty-four hours, and, at the second dressing, the parts are to be washed with pure oil, or liniment, made warm. When the scum on the tumor goes, tender applications must be made, if the cure is effected.

The yellow ointment stops the pores of the cloth (prevents evaporation), and thus confines the effect of the iodine to the target surface. The first dressings are removed on fear-and-civility fears. Dr. Kautskithinks of importance, that the exposed surface should be left uncovered as little as possible. It is therefore recommended to let the patients to urinate nude, before the dressings are removed, and then only to take off one piece at a time.

[illegible]

and in the furrows between alveoli and living parts, be introduced powdered chalk. Then a plaster is applied, and, in tedious cases, a poultice over the plaster.

With respect to the internal treatment, the author observes, that great advantage of the system arises in certain persons from causes which in others produce no effect, and that this depends on a difference in the degree of strength. Hence, he considers that as strength restores the assimilative capacities of parts, and weakness induces them, we should, in all cases, apply the system as strongly as we can, immediately upon the receipt of the injury. In considerable burns, he supposes a disappearance of action to take place between the injured parts and the system at large, or what he terms a section of the continuity of action; and that, by a law of the system, a considerable excretion arises, for the purpose of restoring the equilibrium, or restoring the constitution to that of the state of the part. Hence, Dr. Keenish is of opinion, that the indication is to remove the unity of action of the whole system, as much as possible, by evacuating it from a state as to remove the diseased action, and then gradually bring down the whole to the natural standard of action by slowly traversing the cooling process. Elixirs and tinctures, or other stimulants, are to be judiciously given in proportion to the degree of injury; and repeated once or twice within the first twenty hours, and afterward with care to be reduced, till suppuration takes place, when it will be no longer necessary to excite the system.

In a second essay, Dr. Keenish remarks, that, in the first species of burns, in which the action of the part is very increased, he has not found any thing better for the first application than the burned cream of tartar and cerium resin, thinned with water. In superficial burns, when the pain has ceased, he considers it advisable to derive from this application an about four and twenty blisters, and next the second dressing a digestive, antiseptic thinned with camellia oil, hyssopus, or the third day, with camellia oil, balsamum. This author has immediately seen secondary suppuration excited by the remedy. The most certain remedy for this unpleasant symptom is a digestive ointment thinned with oil, or a poultice of comfrey, and over this a large warm poultice. The ointment will finish the cure. Blistered parts be much susceptible of the system, as antidotes, prepared to the age of the patient should be given.

The growth of fungus, and the profuse discharge of matter, are to be removed, as already mentioned, by spreading powdered chalk to the surface, and by the use of purgatives, in the latter stages. The chalk must be very finely triturated.

Dr. Keenish's theories are, as far as I can judge, satisfactory: they may excite the fancy, but can never improve the judgment. They are easily attainable; they are supported by any sort of rational evidence; and, as being only the dreams of a credulous, sportive imagination, they must soon decline into neglect, if not oblivion. However, in making these remarks, it is far from my intention to express the same animosity as to the mode of treatment issued upon by Dr. Keenish, which issue a question which cannot be determined by reason, but by experience.

OF DELICATE BURNS WITH RAW COTTON.

In America, it is asserted that the best application for superficial burns is raw cotton, finely spread wet, or dried, and put directly on the injured part. (See *Diagnosis of the Deep Cotton in Burns*, in *Porter's Medical Journal*, p. 22; and *Gilman's Treatise and Practice of Surgery*, 3d. ed. 1, Sec. Philadelphia, 1824.) Also, in the *Principles of Gilman*, it is only in superficial burns that this practice answers; but Dr. Anderson, of Glasgow, who has tried it on a large scale, represents it as equally to injure, whether conducted by spreading so much dry, whether superficial or deep, moist or dry, wetted or unwetted. He states, that it has been long applied by the inhabitants of the Greek islands. One of its disadvantages, he says, is, that, except in cases of deep injury, the cure is always slower than without any appearance of inflammation. (See *Glasgow Med. Journ.*, vol. 1, p. 200.) Another is the elevation of the part, always attending the frequent removal of other kinds of dressings; for this is left unchanged a considerable time. Some rise, says Dr. Anderson, is necessary, both in preparing and applying the cotton. For this purpose, it should be

finely sorted, and disposed in narrow flocks, so that it may be introduced; by which means it can be applied in successive layers, and is thus made to fill up and protect the most irregular surfaces. The burnt parts, if wet, are to be washed with tepid water, and the fluid removed by small sponges. Or, if more deeply scorched, they may be heated with a spirituous or mercurial lotion. The system is then applied, layer after layer, until the whole surface is not only covered, but protected at every point, so that pressure and motion may give no annoyance. On some parts, it will adhere without a bandage, especially when there is much discharge; but, in general, a support of this kind is useful. Where the vesicles have been broken, and the skin is scalded, or where there is suppuration, or late suppuration always arises; and, in such cases, Dr. Anderson advises, the discharge may be so great as soon to work through the cotton, and become offensive, particularly in summer, so that it may be necessary to remove the cotton portions. This, however, he advises to be done as sparingly as possible, and being taken to avoid discharging or disturbing the living surface. (See, *cit.*, p. 312.) According to Dr. Anderson, there appears to be a twofold effect from this kind of treatment. The primary effect arises from the exclusion of the air, and the slowly conducting power of cotton, by which the heat of the part is retained, while a soft and uniformly elastic protection from further is afforded. The secondary effect, he says, depends entirely on the shock, or cause, formed by the action, discharging the affected system, or pain, and giving the best possible substance for the best result. "But it may be that the full benefit may be derived, from the stimulus, and to ensure an equable and continued support in the stunted parts, until the new skin is formed, it is absolutely necessary that the cotton should not be removed, except under particular circumstances, and the best advice is sufficiently framed to bear exposure." (See, *cit.*, p. 312.) As Dr. Anderson admits, the theory is of little consequence; and we should not, therefore, attribute a The merit of the practice can be determined only by experience. We have noticed, that Gilman recommends it to superficial burns, and when it is finished, that in other cases the discharge would pass through the unremoved cotton into a moist field mass of scale, putridity, and even suppuration, one can hardly deny that the statement is correct. It is true, the skin may be considered by wetting the cotton in a warm water tub, or bath; but directly this is done, the soft dense property of that substance is lost, and the result is not essentially different from that in which there is not applied, after being wet with the immersion cotton, or other kind applications; and would equally require frequent change. If much constitutional irritation is excited after the cotton has been for some time applied, Dr. Anderson confesses, that it may be necessary to cut out the discharge, or even remove the cotton altogether. "We are then to be guided by the symptoms and appearances, whether to simply cut away the dressings, or first restore a more healthy action in the condition." (See, *cit.*, p. 318.)

The "exclusion of the air" is the true indication in the treatment of burns; but it is imperfectly fulfilled by the dried cotton. In superficial burns, and has long been a domestic application, and can only act in this way; yet when the part is completely covered with a layer of salt, the relief is immediate, and is superficial nature is permanent.

Some surgeons, in this country, treat all kinds of burns on the refrigerant plan; among which Trimmer, Deverge, of Maryland, was among the most prominent. He uniformly directed a water-cure, and was supposed to be at present better, and preserved it until the acute inflammation was subdued, when he used Terebinthine or castor oil as the subsequent dressing. Dr. Keenish's plan is, however, most popular in this country, and almost, in the case of superficial, and the mixture of flannel, of all lime-water are in almost universal use.

As, however, the relief afforded by burns is generally the result of the exclusion of the air from the surface, the modern practice introduced on the system of covering burns with white flour, or other fine white material, will be found by far the most judicious and useful, and the most successful in its results; and that application is adapted to every species of burn, whether occasioned by scalding or actual fire, whether superficial or deep, recent or old, wetted or exposed

were the same practice pursued in a situation in which no air could have access at all, it has been recommended in parts of India through the nostrils, and to remove the air, water has been passed just long enough to serve inflammation, when an attempt is to be made to make the opportunity of the cavity by pressure.

This practice is sometimes approved of by Mr. Brodie on other grounds: he has noticed, that after the whole cavity of the uterus has been converted into an abscess, and this has been cured, no fresh matter enters there again. Hence, he has sometimes been induced to pass into the position a syringe or tube, so (what he deems to be) the base end of a probe, for the irritation of the inner surface of the uterus. This practice I shall not say successfully, on a young woman who was under my care last year. I penetrated the uterus, below the os uteri, and discharged about an ounce of fluid, resembling white of egg. The uterus had existed several months, and the uterus was then evacuated. I kept the patient open about ten days, during which time there was a discharge from it of the same kind of fluid without any tendency to suppuration. I therefore introduced a tent into the opening, by which means the necessary degree of inflammation was excited, the uterus separated, and the disease was more permanently cured, without any serious symptoms. At the same time, I observe, Mr. Brodie is to be perfectly right in maintaining symptoms against the indiscriminate adoption of this practice. Inflammation and suppuration of a large bursa (the ovary) sometimes disturb the constitution so much, that it might be pre-

ferred merely to make a puncture, and keep the patient afterwards perfectly quiet. The pessary is a dissected brass instrument, which he had seen between the lower angle of the scapula and the latissimus dorsi, and which was not much less than a man's head. In this case, death followed the constitutional disturbance excited by a pessary and the union. In another example, seen by this judicious surgeon, when the patient was in bad health, and the due observance of quiescence was neglected, pusillitudo a dissected brass instrument was used followed by death—(Ed. cit. p. 388.)

One or two similar cases, which happened in St. Bartholomew's Hospital, have also been communicated to me. In some instances, the making of too free an incision into the uterus, even has been followed by extensive phlegmonous suppuration of the whole body, ending in death.

When the os of a uterus cancerous is much thickened, and cannot be reduced to their natural condition, Mr. Brodie says, that the uterus, if especially impeded, may be removed with as much safety as is supposed to be. This practice, however, he has only yet applied to the uterus between the pessary and the skin, though he observes to me, of three attempts in particular, which would have enabled him to say more.

Consult *Johnson's Description of the Female Sex*, &c. with remarks on their accidents and diseases, &c. vol. II. p. 570. C. M. Koch, Dr. Maria Ruvig, von Stockholm, &c. and particularly, R. C. Vesalius's *Pathologiae et Chirurgiae Descriptiones in the Joints*, chap. 5, of 2. p. 400. Lond. 1622.

C

CÆSAREAN OPERATION. Called also *Epiotomica*, from *epiota*, uterus, and *reca*, scarre. Puzos, book 7, chap. 9, of his Natural History, gives us the etymology of this operation. "Epiotomica (says he) est sectio perineæ exterioris, sicut Scipio Africanus græcæ naturæ, primæque Cæsaræ uterum mox ante dicitur; quod et cæsar cæsar appellatur. Scipio modo mater uti Scipio per Cæsarum rursus dicitur in-

terum." From this passage we are to infer that the Cæsar operation is extremely ancient, though no description of it is to be found in the works of Hippocrates, Celsus, Paulus Aegineta, or Aulus Cornelius. The earliest account of it in any medical work, is that in the *Chirurgia Galienus de Cæsaribus*, published about the middle of the sixteenth century. Here, however, the practice is only spoken of as proper after the death of the mother, and is alleged to have been adopted only at such a conjuncture in the case of Julius Cæsar.—(See Cap. de *Extirpatione Fetus*.) Vico, who was long revered the close of the eighteenth century, takes no notice of the Cæsar operation; and Pare, who greatly improved the practice of midwifery, thinks this measure only allowable in women who die undelivered.—(De *Morbis mulierum*, lib. 21.) Roux, who was contemporary with Pare, collected the histories of several cases, in which the operation is said to have been successfully performed; and, after the publication of them, the subject excited some general interest.

By the Cæsar operation is commonly understood that in which the fetus is taken out of the uterus, by an incision made through the parietes of the abdomen and womb. The term, however, in its most comprehensive sense, is applied to three different proceedings. It is sometimes employed to denote the incision which is occasionally practised in the cervix uteri, in order to facilitate delivery; but this particular method is named the *external Cæsar operation*, for the purpose of distinguishing it from the former, which is frequently called, by way of contrapposition, the *internal Cæsar operation*. With these views we have seen no allusion the history which is made in the parietes of the abdomen for the extraction of the fetus, when, instead of being situated in the uterus, it lies in the cavity of the peritoneum, in consequence of the rupture of the womb, or in the uterus, or Fallopian tube, in consequence of an extra uterine conception.

INTERNAL CÆSAREAN OPERATION.

Disease, malformation, or a preternatural position of

the cervix uteri, may render this practice indispensable. A scirrhus hardness of the neck of the uterus is the most frequent. When the obstruction is such that the cervix cannot be dilated, and the patient is exhausting herself with fruitless efforts, the parts should be divided in several directions. This has been successfully done under various circumstances. Cases have been met with in which the cervix was procured as opening at all; and yet the preceding operation proved quite effectual. Such is the example which Mr. Simpson has inserted in the third volume of the *Edinburgh Essays*. A woman, forty years of age, became pregnant, after recovering from a difficult labour, in which the child had remained several days in the uterus. She had been in labour sixty hours; but the end of the womb had no tendency to dilate. Dr. Simpson, perceiving that its edges were adherent, and that in opening between them, determined to practice to issue, with the aid of a speculum vast. The incision penetrated to the depth of half an inch before it passed through the substance which it had to divide, and which proved as hard as cartilage. As the opening did not dilate, in the efforts which the woman made, it became necessary to introduce a narrow bistoury in the finger, in order to cut this kind of ring in various directions. There was no hemorrhage; and hardly additional suffering which the patient experienced, arose from the incision of the vagina. As the child was dead, Dr. Simpson perforated the head, in order to render the delivery more easy.

Strong adhesions in the cervix of parturient, may render it necessary for the vaginal Cæsar operation. These sometimes arise as soon as the membranes are ruptured and the waters discharged, so as to prevent the dilatation of the uterus. However, if the contractions seem to continue, and the cervix soon were sufficiently dilated, the child should be extracted with the scissors or by the foot, according to the kind of presentation. On this subject Blandin and Ferrius are of opinion, which was confirmed by the Academy of Surgery at Paris, professor of surgery at Yverdon. The woman was forty years of age, and had been in labour two days. She was in extremely poor health, and could scarcely be known. The pulse was feeble and almost extinct, and her extremities were cold and covered with a clammy perspiration. The edges of the opening, which was about as large as a crown piece, flat, as it were, callous, and hardly had this aperture been dilated, when delivery took place spontaneously. The child was dead. The sym-

Waters were appraised, and the museum agreed to fund a general recovery. Another case, in which the infested curia itself was immediately divided, is recorded by Lachmann, a surgeon in Orleans—(see *Zeit. für Naturgesch. Med.* 1.23, p. 257).

A considerable distention of the neck of the womb, resembling that of a portion of small intestines, may also be a reason for the performance of the vaginal caesarian operation. Thus, such a distention always occasions that of the rest of the uterus, and in the neck of the uterus is usually directed towards that side of the pelvis which is opposite to its flexure, although this is sometimes the case. In the latter circumstances, as the contractions of the uterus in time produce a distention of its neck, which rests upon the bones of the pelvis, the adjacent part of that organ is dilated and pushed from above downwards, so as to present itself in the form of a round smooth tumour, without any appearance of an aperture. Such a case may have had many appearances. Harlequin (alludes to with an instance). A woman in her 34th pregnancy, not being able to endure the distention of the uterus, whose she related, put herself under the care of a midwife, who in her endeavour to deliver, parts during some days. When the accoucher came, on being sent for again, the midwife presented itself in the vagina covered with the womb. The portion of the uterus which contained the fetus, was in a state of inflammation. The os uteri was situated backwards two or six the uterus, hardly dilated to the breadth of a penny-piece, and the waters and loch, discharged a long time. The patient was bled, and emollient Clysters were administered. All sorts of compresses were employed. She was laid upon her back with the joints considerably raised. The midwife had much difficulty in supporting the head of the child, and keeping it from protruding at the vulva, enveloped so it was in the uterus. Notwithstanding each measure, the patient died.

So far as events, more significant, might have been prevented, by looking the witness for years the side against the development of the merger, and employing pressure from above. If these proceedings had failed, by bringing the attention towards the centre of the police, this opening might have been brought into each position by means of the finger, in the interest of the public, and kept as until it was sufficiently distant for the movement to continue.

This is what was done by Bushkovec in one case, where the greatly inflated forehead and the right eye were swollen backwards. The waters enlarged and the facial advanced forward the bottom of the pelvis, flattened in a point of sternum. The whole of the cylindrical labour, which presented itself could be felt with the finger, but an opening was diminishing; after a while the swelling might also be seen on separating the labia from each other and opening the entrance of the vagina. It became necessary to keep the patient restlessly in bed, and to have the finger incessantly introduced; but she was not sufficiently docile to submit to such treatment. Fortunately, the unexpected appearance of two officers of justice, forty-eight hours after the commencement of the labour, had the effect of making her more tractable. It was then too late to become of, for the patient had very become feverish, and, indeed, pained. The abdomen was also so tender, that it could scarcely bear the contact of the clothes. Pelvic symptoms had begun, and the labour could be no longer so continued. Bushkovec made her lie down; and he pressed with one hand on the abdomen, for the purpose of raising the uterus, while with the other he pushed the hand a little way back, in order that he might reach the os uteri, which he now brought with his finger towards the centre of the pelvis, and kept there for some time. The efforts of the patient being now exhausted, she was delivered in about a quarter of an hour. The infant was a very healthy specimen, and the wife had a most favourable temperature.

When the difficulty of the process is such that the process cannot be used, and the engineer and design team is faced with the problem, it is the duty of the practitioner to make the portion of the system that provides the data to the value. This is a case of the design team being the system. A system, however, is not a first class, self-referent system in its own right, but a first class, self-referent system in its own right, that is, a system that is self-referent in its own right, that is, a system that is self-referent in its own right. The system is not a first class, self-referent system in its own right, but a first class, self-referent system in its own right, that is, a system that is self-referent in its own right.

lately occupied by a holy village was protruding heavily and yielded to the pressure of the fingers, once during the labor pains. In extending this tumor he would only feel it, it circumscribed a soft, round, half an inch deep, without any aperture through which the child could pass. Other practitioners, who were consulted about this extraordinary case, were also unable to learn what had happened. They found in the vagina a lacertation, which only afforded a part of the thickness of an ovum. This lacertation was deemed the proper place for making an incision. The operation having been done, the fetus was passed into the uterus in which the child was contained. A large quantity of tarted fluid was discharged. The child passed and passed through the opening, with a slight inclination on the right side. However, having passed his head into the uterus, was unable to find relief for the rest of the body. No particular excitement ensued, and the labor was discharged through the uterus, which gradually closed. In the course of five months the os uteri and neck of the uterus were in their natural position again.—(Lancet, Nov. 18, 1861.)

When the case is a mere laceration of the cornea, or a laceration of the pupillary membrane at the place where it projects into the vagina, the vaginal Casparyan operation is attended with no difficulty. It is performed with a blunt-pointed bistoury, the blade of which is wrapped round with lint to within an inch of the point. The instrument is to be introduced, under the guidance of the index finger, into the opening presented by the strait, and the aperture is to be gently enlarged from within outwards, in various directions. But when the scabrous hardness of the cervix projects on opening it, or when the part of the strait projecting in the vagina is entire, the incision should be made from without inwards, with the same kind of knife. Too much exertion cannot be used, in introducing the instrument, in order that no injury may be done to the child, which has directly behind the substance which is to be divided. No general dissection can here be offered, except that of proceeding slowly, and of keeping the index finger extended along the back of the hand, so that it may be immediately known when the substance of the cervix is cut through, into the cavity of which the finger ought to pass as soon as the knife. But should be necessary to extend or multiply the incision, the cutting instrument should be regulated in a similar manner with the index finger. The cervix after having been divided, the expulsion of the child is either to be left to nature, or to be promoted by the ordinary means. The operation that has been described requires no drainage. If the bleeding should prove troublesome, we are recommended to apply to the vessels a clasp of lint wet with vinegar or spirit of wine.—(See *Obstetric Medicine*, Duguid, &c. L. E.) The shaft of the probe would have to be passed all the way between the cervix of the incision and the upper part of the vagina.—(*Text. des Accouchés* M. D. t. 22. p. 208.)

INTERNATIONAL CRIMINAL OPERATIONS

This is a far more serious operation than that which has just now been treated of, and is the prelude to which the term *Chloroform operation* is more generally used.

There are three cases in which this operation may be necessary: 1. When the father-to-be and the mother died, either in labor, or the first two months of pregnancy. 2. When the father to be died, but cannot be delivered in the usual way, on account of the deformity of the infant, or the hyperemmenic use of the child. 3. When both the mother and child are dying, but delivery cannot take place from the same causes, as in the second case.

In every instance, both mother and child were lined off after the Communist intervention, and the number of followers children attracted—(See *Mother's Journal* of September 1964, p. 112. Also, in *Journal of Democracy*, 5, 1, p. 604, 2, 3, p. 218, in 365. Also, *Mid-County*, and 4, 1, p. 27, 28, 30, 31, and *Sargents Journal*, and 4, 1, p. 27, 30, 31, *Travis*, and 9, 1, and 11, 1.) Very recently in example has been reported, in which Dr. Miller, of Louisville, is also, performed the Communist sessions, and served both the mother and the child. (*Mid-County* for the *Democratic Herald*, 1964, 2, 2, p. 146.)

An instance of similar success is reported by C. H. Greck.—(*Journ. for Obstetrics, &c.* A. 9, p. 13.) Two successful cases, in which both women and children were operated on at the hospital of Münster, by M. Busch.—(*ibid.* Feb. 1823.) Another valuable practical work, one example is reported from Halliwell's Journal, where the author and twelve more all acted by the operation.—(*See Quarterly Journal of Foreign Medicine, &c.* vol. 4, p. 623.)

The most extraordinary case of Cæsaræan operation on record, is one performed by a negro girl on herself, who recovered.—(*See New-York Med. and Physical Journ.* March, 1823.) Dr. Mooney mentions the case of a negro woman in Jamaica, who opened her side with a butcher's knife, and extracted a child, which died of lock-jaw.—*The woman recovered.*—(*See Rayner's Manual of Midwifery, p. 281.*)

In England, the operation has been attended with remarkably ill success; and perhaps there is not one unqualified example, in which the mother has here survived the little Cæsaræan operation. In the third edition of this work, indeed, I referred in the year recorded by Mr. James Barlow, of Cheshire, Lancashire, who sunk in incision into the abdomen, extracted a dead child, and saved the mother's life.—(*See Medical Reports and Researches, p. 151, 178; also, J. Barlow's Essay on Stagnation and Malinjury.*) My friend Dr. Goetz, however, having obligingly communicated to me his doubts, and those of Dr. Hall, respecting the reality of this success having been made (in this instance) on the infant, I was glad to have the opportunity of expressing my entire conviction of the more certain nature of the case taken by these physicians. I am satisfied from the first days, Dr. Hall, that Mr. Barlow was deceived in this case, from the account he gave of the remarkable thickness of the uterus. And I had formed an opinion, that the child had escaped through a laceration of the uterus into the abdomen, enveloped in the membranes, and that he had merely divided the membranes, when he believed he had divided the uterus. Dr. Hall then proceeds to explain the confirmation of his own conviction by those of Mr. Barlow, a very intelligent practitioner at Blackrod, who visited at the operation. "In this, the particulars stated by this gentleman leave no doubt, that the finger had escaped through a laceration of the uterus into the cavity of the abdomen.—(*See Hall's Defence of the Cæsaræan Operation, &c.* p. 72.) The case also referred to by Mr. D. Stewart—(*see Edin. Med. Essays, vol. 5*), where the labour had endured twelve days, and the life of the mother was saved, after the dead fetus had been extracted by a midwife, was also probably of the same nature: at all events, the want of suitable particulars, and the circumstance of the operation having been done by a woman, leave the true nature of the case questionable.

At York, when we speak of the Cæsaræan operation, we mean that in which the panes of the abdomen and those of the uterus are divided by the surgeon, and the fetus extracted, I believe, that as far as the history of the practice extends in this country, it cannot be said, that the mother has ever recovered after such a proceeding; though, more years ago, a calculation was made, that the operation had been done not less than eighteen times in Great Britain; and some there it has been repeated in several instances with the same ill success.—(*See Hædler's Chir., &c.* 2d. Ed. Med. and Surg. Journ. vol. 17.) It is said also, indeed, to have been performed about thirty times in the British dominions.—(*See Rayner's Manual of Midwifery, p. 279.*) Several of the children, however, were saved to have been saved. And in the case operated upon in April, 1826, by Mr. Crockett, of Dorset, the infant was preserved, though the mother sunk eight hours after the operation.—(*See Edin. Med. and Surg. Journ.* No. 36, p. 31.) On the contrary, the practice has proved infinitely more successful; as of 321 cases of this operation to be found in records of medicine, 232 are said to have terminated successfully.—(*See Ellis's Edin. Med. and Surg. Journ.* vol. 8, p. 17.) No doubt, the ill success of the Cæsaræan operation in England was correctly explained by Dr. Hall: "In France and some other nations upon the European continent, the Cæsaræan operation has been, and continues to be, performed where British practitioners do not think it indicated; it is not less successful to-day, before the strength of the mother has been

enfeebled by the long existence and frequent repetition of hemorrhage, though, according to him, and before her life is endangered by the accession of inflammation of the abdominal cavity. From this view of the matter, we may reasonably expect, that ourselves will be more frequent in France than in England and Scotland, where the reverse practice obtains. And, as France, that the value of the operation ought to be appreciated. Who would be so stupid as to imagine, that a recovery after such circumstances, be it generally less successful, as in this country, usually, where the child has laboured for years under inflammation of the uterus, a disease fatal to itself in itself; where, as has been brought into immediate danger by previous inflammation of the uterus, or other contents of the abdominal cavity, or been exhausted by a labor of a week's continuance, or even longer?" Dr. Hall then refers to the opinion of Mr. W. Anderson, that out of sixteen new errors in medicine, or some peculiarity in the constitution of the female of this island.—(*See Hall's Defence of the Cæsaræan Operation, p. 10.*)

The general readiness of continental practitioners to have recourse to the Cæsaræan section has been constantly observed, because they have even operated in cases in which the patients had previously borne children in the natural way. According to Mr. A. W. Anderson, there are not less than seven cases in which the mother has survived the operation, and the child has been born alive. Anderson, who also speaks of the operation, is the Editor of the *Edin. Med. and Surg. Journ.* No. 161, a third by Meier, in *Medic. Ann.* vol. 1, and a fourth in the same journal, by Boerhaave.—(*See Rayner's Manual of Midwifery, p. 279.*) Certainly, if a woman had already borne children in the natural way, the first incision to be made in a strong argument against the necessity of the operation, but perhaps not in its absolute indication, since every thing must depend on the actual dimensions of the lower opening of the pelvis in relation to the size of the existing fetus.

When the fetus is contained in the uterus, and can not be expelled, by reason of the excessive extension in which I have already referred, and embolism, or the practice of sacrificing the fetus and extracting it, if prevented by the vagina, be deemed necessary, the Cæsaræan operation should be practised, since the mother and fetus both perish from the violence of the pains, hemorrhage, convulsions, &c.

For this purpose it is necessary to make an incision in the integuments of the abdomen, and in the uterus. Some have thought that passing the point of the scalpel would be mortal, while others have believed a wound of the uterus, rapidly dangerous. Hence such persons have considered the operation as the principle that religious reasons do not admit taking one life to save another. As the operation of the Cæsaræan operation for the hemorrhage which they are most afraid, indeed, if the uterus were not to contract sufficiently when the fetus and after death was away, the bleeding would prove to be fatal. But when, by means of the Cæsaræan operation, the fetus is extracted, together with the placenta and membranes, the uterus contracts, just as a case after a natural labor. Besides, even when the mother is alive, the operation is not necessary, since the fetus is removed a propensity to deliver itself, and to contract. The womb being delivered of its contents, the incision becomes closed, the vessels contracted, and there is no risk of hemorrhage. The wound itself also heals as usually an organ more disposed to contract; but whenever arguments may be collected, it is enough to say, in this case, after repeated trials, it is equally successful. But, in the case, indeed, as I have mentioned, in which the operation was performed for the hemorrhage which they are most afraid, indeed, if the uterus were not to contract sufficiently when the fetus and after death was away, the bleeding would prove to be fatal. But when, by means of the Cæsaræan operation, the fetus is extracted, together with the placenta and membranes, the uterus contracts, just as a case after a natural labor. Besides, even when the mother is alive, the operation is not necessary, since the fetus is removed a propensity to deliver itself, and to contract. The womb being delivered of its contents, the incision becomes closed, the vessels contracted, and there is no risk of hemorrhage. The wound itself also heals as usually an organ more disposed to contract; but whenever arguments may be collected, it is enough to say, in this case, after repeated trials, it is equally successful.

The possibility of operating successfully on the

living mother was pursued with great perspicacity and accuracy by Simon, in the *M.moires de l'Acad. de Chirurgie*, t. i. 136. Here we are presented with a collection of sixty-five Cæsaræan operations, more than a half of which had been done in thirteen women. Some of these had undergone the operation once or twice; others five or six times. There was one woman in particular who had undergone it seven times, and always with success. This seems to prove, notwithstanding all assertions to the contrary, that the operation for the most part succeeds. But if the life of the mother should not eventually be preserved, this Cæsaræan operation ought not to be regarded as this success; it might always be done when relief cannot be obtained by other means; just as amputation and lithotomy are practised, though they are not constantly followed by success. Would any thing be more cruel than to pluck a mother and her child, and leave them to perish when there is any hope of saving them both? It is true, that when a pregnant woman is free of any internal disorder, and that from the pains and efforts of labour, the fetus is sometimes still alive in the uterus; but in cases of death after difficult labours, and the great efforts made by the uterus to overcome the obstacles to parturition, the fetus is generally dead; and the operation therefore is less likely to be successful.—(See Blandin, *Traité des Opérations de l'Accouchement*, chap. 5.)

It is the opinion of the best writers upon this subject, that whenever a woman dies at an advanced stage of pregnancy, the performance of the Cæsaræan operation is highly proper. The propriety of this practice in such circumstances was known to the ancient Romans; for by a letter of Neræ Prætorius, we know that when pregnant was sufficed, to be buried, and her body had been opened, with the view of preserving the fetus, the use of the sword.—(Sprengel, *Geschichte der Chir.* v. 1, p. 311.) Experience has proved, that when the fetus has not attained the period at which parturition commonly happens, it will sometimes survive the operation a considerable time, and that when it is fully grown its life may be almost happily preserved. Although instances are cited, in which the fetus in utero has been found alive a month or two and twenty days after the death of the mother, little stress should be laid on such prodigies. The operation would be done without any delay. Even then we are not certain of saving the infant's life. In the greater number of instances the fetus perishes at the same time with the mother, and from the same causes. The cases which are recorded of the fetus being extricated alive after the death of the mother, are extremely rare; I shall here only refer to three, two of which rest on the respectable authority of Hippocritus, who was himself the operator.—(Cassiodorus de Conventibus, &c. in *Uterinis*, lib. 2, p. 144–146.) In one of these instances, the operation was done on a woman killed by violence in the sixth month of pregnancy; the child lived six hours; in the other, a fetus was extricated from a woman who had died of typhus fever in the seventh month, and though the operation was not done till she had been dead about six hours, the child was taken out alive, and continued to live full ten minutes. A living child was also taken out of the mother by Vesalius, after her death by typhus.—(Haller, *Obs. Med.* Lugdunæ, No. 74, p. 47.) Sprengel, *Geschichte der Chir.* v. 1, p. 314.) On the 12th of April, 1830, Mr. Green, of St. Thomas's Hospital, extracted by the Cæsaræan operation, from a woman suddenly killed in the sixth month of pregnancy by the passage of a stage coach over her, a fetus that lived 48 hours after its removal from the uterus.—(See *Med. Chir. Trans.* vol. 19, p. 60.) With respect to the contents of the uterus, it is a familiar maxim, *non fœtus fœtendi*, in considering them as mere lifeless organizations; five instances are given, in which the fetus was taken out of the mother three days or twenty-four hours after her death, and still continued to live. Graafius says, that at Sydenham in the course of eighteen years, the operation had been pursued twenty times with the same circumstances; that at Grægorius, thirteen children were saved out of twenty-two mothers who had died pregnant; and that in twenty-four years, at Montpellier, twenty-one children were preserved in the same manner.—(Kempner's *Icones*, Feat. 1768, 166.) As Sprengel remarks, he has to admit, except from this system, that in binary pregnancy was generally fatal,

If the mother should happen to die in labour, and the neck of the uterus were sufficiently dilated, or disposed to be so, an attempt should be made to accomplish delivery in the ordinary way; for examples have occurred in which women, supposed to be dead in this circumstance, were in reality alive. Hence we find that the Senate of Venice, in 1608, enacted a law, by which practitioners were liable to punishment in case they neglected to operate with as much caution as a pregnant woman supposed to be dead, as on a very objectionable and false to be observed were death issued by the same government in 1700.—(Nott, *Med. et Chirurg. Antiquæ*, p. 108, the Venice 1721.) Ponsard, *Obs. de l'Opération Cæsar.* p. 15, 16, 17, 18, 1778.) A law to the same effect was likewise made in 1719, by the King of Sicily, who directed the practitioners of death to these medical men who omitted to perform the Cæsaræan operation on such women as died in the advanced stages of pregnancy. In the doctoral case of the Duke of Savoy, 1718, the following case, continuing the propriety of such cautions, was recorded by Rucellandus, surgeon to the military hospital at Besançon. This practitioner having been sent for to a woman, to whom no assistance he was unable to proceed till five hours after her apparent death, he found the child with which she was covered, deceased, and perceiving that the body retained its suppleness and warmth, he tried whether the uterus could not be extricated in the ordinary way, which was immediately effected as soon as the feet were put forth. The first endeavours to save the child were very unprosperous; but after a few hours they had the desired effect. As the woman continued in the supine position five hours afterwards, Rucellandus recommended that she might not be buried before her limbs were quite cold and stiff. He observed that the candidate for Jura University was also ordered to life. This remarkable case happened on the 20th of June, 1719, and both the mother and child were living in the period which Rucellandus published the above account.

Supposing, however, delivery in the ordinary manner to be impracticable, in all events the Cæsaræan operation might be performed with the same cautions as if the mother were alive, only one caution being made for the purpose of saving the uterus.

Almost all the inextinguishable choruses to delivery originate from the bad construction of the pelvis, depending upon nature; though they are not an inevitable consequence of it, since there are women extrinsically deformed, in whom no impediment of the pelvis exists, while it prevails in others whose shape is but trivially disordered. An examination of the dimensions of the pelvis is the right mode of ascertaining whether there is really such an impediment to parturition. In order that the dimensions may not be an obstacle to delivery, the distance between the upper rim of the sacrum and the os pubis ought to be three inches and a half; and the distance between the tuberosities of the ischia and between each of these protuberances and the point of the os pubis, five, three inches. Women have indeed been known to be delivered without measure, although the first of the above distances was only two inches and a half; but then the heads of the children were so situated, that the great diameter was nearly eight inches, while that which extends from one point to the other was reduced to two inches five or six lines, and the infants were *trifles*. If they are to be born alive, they must be taken out of the womb by the Cæsaræan operation; for the latter proceeding should never be adopted without a certainty that they are *trifles* living; for whose death they may be corrected in a way that is attended with much less risk to the mother.

It is not always in any patient so uncertain with certainty whether a fetus is alive or dead, or on death. It has entirely ceased to move, after being affected with a violent motion, the probability is that it is no longer alive. But to be certain, instead of examination is necessary, which may be performed in two ways. One consists in pressing upon the uterus, through the pliability of the abdomen. If the child lives, such pressure makes it move, and the motion can be plainly felt and distinguished. In the other method, one hand is employed in pressing upon the uterus externally, while with the fingers of the other hand passed up the vagina, corresponding pressure is also to be made. The uterus is likewise to be moved as far as possible, in order to make use

status is even. When no decisive indications can be trusted obtained, it becomes necessary to rupture the membranes, if they have not already given way, introduce the hand into the uterus, and put a finger inside the child's mouth, for the purpose of making it turn its breech. This finger may also be applied to the nape of the head, so as to determine whether this organ is lying; and the vaginal cord may be caught, in order to determine whether there is still a presentation, or not. When none of these precautions furnish successful information, the conclusion is that the child is dead, and no attempt is indicated, unless the satisfaction of the parts be such that the best chance be given to the system, in which case, the Cæsarean operation is indispensable.

The first and most direct judgment respecting the dimensions of the pelvis? And how can we know whether that measure which extends from the upper edge of the sacrum to the os pubis, is long enough to allow the passage of the child? The proper conformation of this part is known by its thickness and equality of the lips, both on the transverse and perpendicular direction; by the projection of the pubis; by the moderate depression of the sacrum; by an extent of four or five inches from the middle of this depression to the bottom of the sacro-coccygeal; by an extent of seven or eight inches from the superior process of the last lumbar vertebra to the highest part of the most vertebra, is a woman moderately fat; and by their being an adhesion of each to each, is seen between the two anterior superior spines, protrusion of the os coccygis.

These general indications, however, are insufficient. In order to acquire more correct opinions, double compasses have been employed. The handles of the first being applied to the top of the sacrum and middle of the trans vertebra, three inches are to be deducted from the distance indicated by the instrument, viz. two inches and a half for the thickness of the upper part of the sacrum (which is said to be constant in subjects of every size), and half an inch for that of the os pubis. In women who are exceptionally fat, some lines must also be deducted on this account. Hence, when the last thickness of the pelvis measured in this direction is seven inches, there will remain four for the distance from the upper part of the sacrum to the os pubis, or the extent of the lesser diameter of the upper aperture of the pelvis.

For taking the measurement internally, a kind of scissor has been invented by Connolly. It bears a considerable resemblance to the instruments employed by shoemakers for measuring the foot. It is passed into the vagina, with its two branches approximated, until one arrives opposite the anterior and upper part of the sacrum, when the other is to be drawn externally, so as to be applied to the pubis. The distance between the branches is judged of by the graduations on the instrument. This was named by its inventor a pelvimeter. According to Sabatier, it is not always easy to place it with accuracy; its employment is attended with some pain; and there are particular cases in which it cannot be used.

Instead of this instrument, the celebrated Baudouin recommended a means which seems to be very easy and simple. The index finger of one hand is to be introduced into the vagina to the upper part of the projection of the os pubis. The finger, during the radial edge turned forwards, is then to be inclined obliquely till it touches the arch of the pubis. The point of contact being then marked with the opposite hand, the length from the point in question to the end of the finger is to be measured. This length, which indicates the distance between the sacrum and the bottom of the symphyseal pecten, usually exceeds that of the lesser diameter of the pelvis by about six lines. Baudouin acknowledges that this measurement is not exactly accurate; but he believes it will do very well, because, unless the measurement of the pelvis be extreme, two or three lines hardly indicate difference in the facility of parturition.

The following is the description of the pelvis of the woman twice operated upon by Dr. Leboyer. The os pubis, which should be on the same level with the promontory of the sacrum, were found perpendicular to it; so that the child necessarily required the abdominal circumference to its own weight, little is probability in compressing the thighs. The os coccygis, nothing could be felt of the child by external ex-

per exposure. The os coccygis, instead of showing the pelvis, was hidden by a vesicular sac, which forms a kind of cushion to the child in parturition, denoted nearly horizontally backward. A symphyseal cyst of this pelvis, with a few other particulars, may be seen in a modern publication.—(Med. Chr. Trans. vol. 21, p. 189.)

The pelvis may be every where well formed, and yet present an extraordinary obstacle to delivery, in such an obstacle, however its dimensions, which extend to the bones which compose this part of the skeleton. Passing out with a ease of this description is a woman who had such a case. The os coccygis was drawn from one of the two points. A vesicular cyst, filled with the head of the child in the upper aperture of the pelvis, eight weeks or the same effect which it was directed, and could be pushed out of the way, so as to make room for the fetus to pass. Baudouin mentions a swelling of this kind. It was on or seven inches long, and an inch and a half in width. The extremity of it, which was as large as half a beef's leg, had a heavy foot, and contained four well formed teeth, the rest of the mass being oblong. It had descended into the lesser pelvis, below the promontory of the sacrum, and a little to one side. It might have been taken by an incision of this last bone. The instrument consisted sixty hours, and the possibility of performing the Cæsarean operation was under consideration. Baudouin was sworn to this proceeding. He was concerned turning the child and extracting it by hook, because he thought that the pelvis was sufficiently spacious to admit of delivery. The os coccygis was cut at three inches from the lower part of the sacrum, and four inches from the lower part of the sacrum. The fetus was soon easily extracted. The assistance of the forceps was necessary to get out the head. The child was well born. The mother, exhausted with numerous travelling efforts, only survived between fifty and sixty hours. Baudouin was of opinion that a decisive regimen also tended to increase her death.

Among the innumerable obstacles to delivery may be reckoned such a displacement of the uterus that this viscera protrudes from the abdomen and forms a hernia. The records of surgery have preserved some examples of this extraordinary occurrence. Twice has the Cæsarean operation been performed on one of the two cases, the woman survived so long that hopes were entertained of her recovery. Indeed, as Sabatier observes, why should not the operation succeed in such a case, where the uterus is only moved by the ligaments, and there is no occasion to raise the abdomen, just as well as other instances in which it is indispensable to divide the uterus, and open the cavity of the belly? In the other case on record, delivery was effected in the ordinary way, after raising the abdomen and keeping it in this position with towels skillfully placed, or by making pressure on the uterus, which had the beneficial effect of making this organ resume its proper situation.

History shows the absolute necessity for the Cæsarean operation under certain circumstances, a minute to consider the proper time for performing it, the legitimate preparatory means, and the method of operation.

With regard to the time of operating, practitioners do not agree upon this point: some advising the operation to be done before the membranes have burst and the waters been discharged; others not till afterward. The arguments in favor of the first plan are, the facility with which the uterus may be opened without any risk of injuring the fetus, and the hope that the uterus will contract with sufficient firmness to prevent hemorrhage. The advantages for the second mode being, that in operating after the discharge of the waters, there is less danger of the uterus falling into a state of relaxation in consequence of having suddenly emptied after being fully distended, and that this point does not demand so extensive an incision. Hence they recommend, as a preliminary step, to open the membranes. Whatever conduct be adopted, it is essential that the uterus should be support and supported, that the cervix uteri should be effaced, and that the os tunic should be sufficiently dilated to allow the fetus to be discharged; and at the same time, safe perhaps, if the operation is not to be done till after the escape of the waters, there ought not to be too much delay, lest the patient's strength should be exhausted,

and the violent effects of labour should bring on an inflammatory state of the parotid or the testis.

The government is using the victims and bloodies to pretend that it is necessary to insist upon it. This pretension is only particularly obvious in regard to the list of those officers, which has been known to have been made after the Germans as to control the southern part of it. Everything had been done to prevent this organization in a broader area than it was operating. The machine would then be moved and presented itself through the same defeat of the opposition in the character of the modern.

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For the purpose of understanding the operation, the student should be placed at the edge of her back, well supported; her chest and head should be comfortably raised, her knees should be somewhat bent, and held by assistants, one of whom might be at the elbow, and from there downwards, so as to compress, in some degree, the swelling of the uterus, and prevent the pulsation of the bowels. These things being attended to, the engagements are to be decided with the convex-sided trowel, in the usual of at least six inches. The plane and direction of the incision differ with different operators.

13. The most accurate method, it was customary to make the incision between the outer edge of the testis, namely, a line drawn from the umbilical superior mesenteric process of the testis, to the junction of the base of the third rib with the cartilage. Thus cut very lightly a little below the umbilicus, and was continued downwards as far as an inch above the pubis. After the integuments had been drawn, the various appendages, and peritoneum were cut, and the uterus cautiously opened. The left index finger was then introduced into this vagina, the wound of which was dilated by removal of the probe-pointed bistoury.

This manner of operating is subject to great inconveniences. The place where the incision is made is the situation of the placenta, the fibres of which have a different direction, and, as compressing, separate the edges of the wound, and make it gape. The considerable blood-vessels which ramify there, may be the source of serious bleeding. The births can scarcely be that accurate unless reliably than any where else. When the position of the uterus is oblique, and when, consequently, the edges of the incision are turned forwards and backwards, and its surfaces to the right and left, the uterus will be made in one of the lateral positions of the uterus, when the trunk of its blood-vessels are known to be twisted, and sometimes even the Patauian tube and ovary may be cut. The fibrous of the uterus are not transversely, so that the edges of the incision are apt to gape, instead of being in contact. The last circumstance may the more readily permit the uterus to escape into the abdomen, inasmuch as the uterus is cut nearly through its whole length, and there is no cavity in which they can accumulate in order to be discharged through the os of the uterus.

The latest skin has been frequently considered the most eligible place for making the incision. As Professor Williams writes, it was the method adopted by Boileau and Delorme, and it has the recommendation of Sir John Dalrymple, because these are better parts to be cut, and when the wound is exposed, an incision parallel to its principal fibres may be made in the middle part. Boileau thought that this plan of operating originated with Flaminio and his son, a surgeon of Cremona. A German surgeon says: "Incisions made across cutaneous vessels give rise to hæmorrhage and more pain; first, because, upon abdominal wounds, the vessels may, by constant contraction, or constant external pressure, be closed; in this case, much as incisions are better here, which began a little above the umbilicus and extended to within an inch and a half of the navel." He afterwards divided the fat, muscles, and peritoneum in order to get at the viscera, the exterior part of which was removed, the wound being made rather in the body than the flange of the viscera. Dalrymple still has a great deal more to

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This mode of operating, as Sabatier observes, gives more scope of vision than the plan first described; but he agrees that such scope has not been realized by experience. Though the operation may have been more easy, he believes that the edges of the wound in the skin, and those of the incision in the peritoneum have had no tendency to rejoin in a state of proximity to each other, because the linea alba is the point in which all the large vessels of the abdomen principally sit, and because the contraction of the clamps necessarily takes place from above downwards. Sabatier alleges that the wound in this vessel has been found to refuse to join of its sides, for the same reason as occur in operating on one of the sides of the abdomen. He also states, that the intestine has been conveyed under the integuments of the upper part of its plexus, and that the pressure of the bladder renders the wound soon being carried sufficiently far down. Perhaps, may be, a part of these inconveniences which depend upon the contraction of the apertures, and the want of this organ in its natural state, might be avoided by extending the incision to its highest part. Randolphe has advised this plan with the view of preventing the fatal adhesions in the abdomen, which frequently follow this operation. Sabatier, however, has doubted whether in operating in the same site, the wound can be carried high enough. Besides, he maintains, that this operation would not prevent the wound from getting, nor the greater tendency of the intestines to be extricated by the abdomen than to retract into its cavity, and be discharged through the os tunicæ. (*Medical Operations*, tom. 1, p. 273, 274.)

In this country (where, indeed, the Cassinetti operation has proved most successful) the same note is preferred, I believe, by the majority of practitioners. That the method is not always attended with the desirable objections urged against it by Kottwitz, is quite certain: the epicurean published by Dr. Thompson is a deliverer proof of this assertion.—(See Edin. Med. and General Journ. vol. 4. p. 176.)

There is a third method of performing the substituted Newman operation. It consists in making a transverse section five inches in length, through the posterior end of the chest, between the scapulae and the spine, and in a situation five or six inches from the axilla, at the level of a elevated position of the scapula. This has been recommended by Lawson, as a published method, Novelski of Moscow has published the position of Lawson. Parry, in 1882, has published a modification that the method had been used.

carefully positioned by different persons before the mother, and especially in one instance, which was particularly remarkable, as, in consequence of the first incision having been made too high up, it became necessary to make a second one, which extended, of course, from the other. However, according to Skene, Lacroix has an objection as if he had accepted his plan, since he has given a better explanation of its advantages than any of the predecessors.

The wife on which the operation was to be done is, in itself a matter of indifference. But if the liver or spleen were in position, one ought to avoid it. Also, if the uterus were to incline more towards one side than the other, it would be proper to operate on the side where the vessels could be most conveniently exposed. The patient being put in a prone position and held by assistants, and her abdomen kept steady by an assistant, who must apply the point of his hands to the sides of the uterus, the integuments, muscles, and peritoneum are to be divided with the usual precautions. The uterus is then to be opened, and the wound in it enlarged to the requisite degree, by means of a probe-pointed bistoury. Should the placenta present itself, care must be taken not to lacerate it, for fear of opening one of the arteries of this mass, which communicates with the umbilical arteries of the child, or of leaving a portion of it in the uterus; but it should be separated, in order to facilitate bringing the incision into its circumference. The child is next to be extracted. This part of the operation is subject to no general rule. Delivery being accomplished, we are recommended to introduce through the vaginal canal, speculums, in order to lessen spasm, and which cut the coagula. This method is preferable to that of clearing out the uterus with the hand. Scudder most properly condenses the plan formerly advised by Blandin and Haisse, of passing up the neck of the uterus a catheter for the purpose of washing out the lochia, as well as the absurd proposal of employing a sponge to push them away. Should the lochia not pass readily upwards, we are recommended to introduce the finger occasionally into the cervix, until, as to force, it finds the coagula, which may obstruct it.

Scudder observes, that nearly all authors who have spoken of the Cesarean operation, whether performed at the sides of the abdomen, or in the lower part, have advised keeping the edges of the wound in the skin, muscles, and peritoneum together, by means of the interrupted or twisted suture, care being taken to place at the lower part of the incision a suture in order to prevent adhesion, and leave a free issue for whatever discharge may take place from the abdomen. Others have been content with recommending the use of adhesive plasters and the twisting ligature.

Scudder condemns sutures as painful and irritating, and he states that the other women only act upon the skin, without holding the object in view, because the integuments have no fixed point, and the divided muscles tend to contract. He asserts us, that in the last mode of operating, the edges of the wound may be brought into contact by merely laying the patient upon her side. Besides, he remarks, that there are not many muscular fibres cut, those of the transversals being only separated from each other. He affirms, that this manner of operating also favours the approximation of the edges of the wound in the uterus, in consequence of the uterus contracting more extensively in the perpendicular direction. It is likewise asserted, that as the uterus has only been opened at its upper part, it affords no middle and lower portions a large cavity, which does not communicate with the abdomen, and in which the lochia may easily accumulate, and afterwards be discharged by the natural way. The only advantage advised by Scudder is, a large, slight, convergent, and a moderately tight bandage round the body. These are to be changed when soaked with the current or discharge. In this country practitioners would not hesitate to drag the edges of the wound as much as possible together, by means of strips of adhesive plaster. But, though they may not act with so much effect in this situation as in many others, they undoubtedly assist in preventing the separation of the vagina, which is the kind of laceration the upper part of the uterus, if possible, by the best method. I have no doubt there are many who would be introduced by Scudder. In this country, the last method of operating has also been tried.

Mr. Wood, of Manchester, performed the Cesarean operation, in a case in which post-mortem was prevented by delivery of the foetus. The incision was made nearly in a transverse direction, on the left side of the abdomen, about five inches in length, beginning at the umbilicus. This part was fixed upon bones, the sides of the child could be felt there, and it was evident that no intestine was interposed between the abdominal parietes and the uterus. There was scarcely any effusion of blood, either from the external wound or from that of the uterus, though the time was made directly upon the placenta. Instead of dividing the placenta, Mr. Wood introduced his hand between it and the uterus, and, laying hold of one of the child's knees, exerted the fetus with ease. His hand readily passed between the placenta and uterus; this produced no hemorrhage, but was very successful. He drove, in the whole quantity of blood but not an exposed artery or vein. After the uterus was emptied, the intestines and ovaries protruded at the wound. These having been reduced, the integuments were brought into contact with sutures and adhesive plaster. This operation, however, did not save the woman's life; she died on the fourth day after the operation—(see Med. and Physical Journal, vol. 3.) As I have already explained, the ill success of the Cesarean operation in England has been such, that not a single case has yet happened in which the use of the method has been preserved after the child was truly extracted from the womb by Caesarean. The probable reason of this circumstance I have already stated. Alford, however, the surgeon of the prison some years ago, has been successful in this country, the operation having been often given as to it with the same look of the mother and child of which of some interesting example was recently published by Dr. Lown, of Zurich—(see Med. Jour. Trans. vol. 3, p. 11.) And in vol. 11 of the same work, may be read a case in which Dr. Meyer, of Hanau, lately saved a woman by the operation, but the fetus was dead. I have an example in which Dr. Spahn, in 1801, preserved the lives both of the infant and mother, and another interesting relation of two Cesarean operations performed by Lomax, on a woman who being at Nines, in Bohemia—(see also Nichols's *Annals of Gynaecology*, &c. vol. 3, part 1, p. 189.) In 1800, Dr. Schlegel, of Mannheim, likewise operated on a woman who recovered, notwithstanding the wound became supplicated, and she is still living, with a healthy child the situation of the wound—(Schlegel's *Archiv. des Anatomie*, p. 155, *Ann. Paris*, 1805.) The Cesarean section has been successfully performed by Grisel, at Berlin, the woman and child both having been saved—(Journal, &c.) And besides this and various other instances of success already referred to, another was afforded in April, 1802, in the person of Vanderburgh—(see *Review* &c.)

In the *Western Journal of Medical and Physical Science* for April, 1803, Dr. Dickinson, of Newbern, Ohio, reports a successful case of Cesarean operation, performed in 1807. He was under the necessity of performing the operation in midwifery, on the spot of the moment, without a consultation, and under most unfavorable circumstances. After he had divided the uterus and the placenta, which was attached directly under his incision, he found it impossible to remove the fetus, until he had divided the uterus of the thick part the upper lateral vessels, when it was extracted with facility. The mother recovered entirely in four weeks.

The necessity for the operation arose, from inflammation of the uterus and vagina. His examination of the patient per vaginam, on the day previous, Dr. Dickinson found the whole depth of the vagina but two-thirds of a finger's length, the anterior wall being a kind of septum passing obliquely upwards, from behind backwards, leaving about one and a half inches between it and the cervix, and the distance in time would not be discovered by the most minute examination. He notices to the operation, that it is an artificial laceration, and he describes a kind of tube extending from the uterus to within three-fourths of an inch of the cervix, sometimes, improving below, and probably entering, slowly into the vagina. He offers to insert in the mother in which conception had taken place. The woman was returned at the time, but has since lived with a husband two years, but no conception has

taken place. This is the first and only instance of the successful performance of the Cesarean section in the United States.—*Note.*

OF OPERATIONS WHEN THE FETUS IS EXTRA-UTERINE.

Delivery cannot possibly happen in the ordinary way, when the fetus is situated in the uterus, or Fallopian tube, or in the cavity of the peritoneum. However, there are many instances recorded of ventral protrusion, whilst the mother survives, the dead fetus having been discharged by fragments out of an abscess in the parietes of the abdomen. A remarkable case under Mr. Gearing, in St. George's Hospital, I had the opportunity of seeing a few years ago, in which the child was discharged piecemeal from an abscess on the right part of the abdomen; and I have lately seen another case under Dr. Hickey, of Westminster, in which portions of bone and a great deal of matter have been voided through the vagina, though the swelling is altogether on the right side of the abdomen.

Practitioners are occasionally called upon to do a very singular operation in the Osseous, when the child has passed into the cavity of the peritoneum, in consequence of the rupture of the uterus. Unfortunately, such an accident is not uncommon, and though the chance of it may not be obvious, holding a more terrible truth than the latter itself is entirely proven, and has no share in producing the misfortune. The symptoms, by which the event can be known, are not always easy of misconception. When, however, the pains have been violent; when the face, after being excessively swollen, has been relieved by a kind of relief; when the countenance loses its colour, the pulse grows weak, and the extremities become cold and covered with a cold sweat; when the abdomen is generally flat and only partially affected with a swelling, accompanied by the fever, which either continues to grow, or is dead and malignant; when the patient complains of a distressing sense of heat above the belly; and lastly, when the child strikes from the touch of the abdomen; it is regarded that the uterus is lacerated. If the child has passed completely into the abdomen, putrefaction is the only poison. Should a part of it, however, yet remain in the uterus, it may be extracted with the aid of the forceps, or the local promote, or by the leg, provided only the upper part of the body be in the abdomen.

Bulloughs quotes three instances of putrefaction, performed on account of the rupture of the uterus. The first is that inserted by Thomas Dobson, in the *Journal de Médecine*, for May, 1760. Every preparation was made for a natural labour, when, after an extremely violent pain above the upper and left part of the uterus, the child disappeared. Dobson opened the abdomen, though not till some hours after the accident. The infant was dead; but the mother experienced no ill effects after the operation, except such as are usual after ordinary labours.

The second and third cases were communicated to the French Academy of Surgery in 1775, by Laribon, a surgeon of Orleans. He practised the operation twice on the same woman with success. In the first instance, he opened eighteen hours after the rupture of the uterus. The child was dead. An ill-conditioned abscess formed near the wound; but the patient got quite well in the course of six weeks. She was pregnant again the following year, and the uterus was now more relaxed. Laribon now had recourse to the operation without delay. The child delivered some signs of life, but soon died. The mother got only six weeks; but afterward became pregnant again, and had a favourable delivery.

In a singular case, I have alluded to the case in which Dr. Locher, of Zwick, saved both the mother and child by the Cesarean operation, performed in the last case. After her recovery, a small part of the wound, not extending to three lines in length and breadth, required a ligature to be quite healed, though no particular inconvenience was experienced from it. Some time afterward the uterus grew very tight, and a portion of membrane protruded, which was removed, with a piece of brown cane, and was again removed. The edges of the wound were then brought together, but a small superficial ulcer continued in spite of every effort to cure it. In 1795, the year following, that in which the Cesarean operation had been performed on her, she became pregnant

again, and the child particularly which happened during position, was an increase in the size of the protruding ulcer, which became three inches in width. The son, however, was delivered with ease, and the arguments well supported with adjuvant plaster. On the 23d of May, she was seized with labour-pains; and about seven in the evening, she complained of at once of a very acute pain, and at the same moment voided a considerable quantity of blood from the vagina. On examining by this passage, nothing was discovered; but, when the hand was applied below the navel, in the line of the old wound and under the ulcer, a discoloured firm swelling was felt, covered by the child's head, of which the uterus was partly dissipated. Dr. Locher naturally concluded, that the uterus had burst, so as to allow the child to escape, and the hemorrhage was thus easily explained. A repetition of the Cesarean operation was deemed unnecessary. The place of the wound was discoloured by the wound swelling, caused by the child's head. An incision six inches in length, was made into the abdomen, where a quantity of coagulated blood was found. When this had been removed, the membranes presented themselves, containing a black line; and after they had been opened, the head of the child immediately appeared. The navel-string was cut round the neck, which was then compressed by the opening of the uterus. The child expired as soon as life. The placenta came away during the attempts to transverse the child. The mother recovered, and there was little bleeding. This patient, after a good deal of indisposition, and occasional approaches to a perfect recovery, died at length attacked with inflammation of the stomach and bowels, and died on the 9th of July. The uterus was found contracted to a small size, with an opening of about the size of an almond, on an anterior surface, with a rounded ragged edge. This aperture, Dr. Locher speaks, had remained ever since the first operation, and had allowed the escape of the child in the second labour; a circumstance which may be doubted, as the hemorrhage followed the period when the uterus had been lacerated, and the position indeed lay in one place particularly suited herself. (See Med. Clin. Trans. vol. II, p. 162, &c.) An almost incredible case is related of what may be called a Cesarean birth, effected solely by the powers of nature, and, as would appear, by a sudden rupture of the vessels and rupture of the abdomen, after the patient had been in labour three days.—(See *Lancet and Old Physical and Literary*, vol. 5.)

A laceration in the uterus, or the wound made in this tissue in the Cesarean operation, may give rise to dangerous and even fatal symptoms of strangulation if any of the arteries mistake themselves into the peritoneal opening. When such an occurrence happens in the performance of the preceding operation, the intestine must be directly withdrawn and replaced. If the accident were to happen, when the child is extracted in the natural way, the lower is to be pushed back into the abdomen from the uterus. Were the occurrence to take place several days after the operation, Sabatier inquires, what ought to be done? A surgeon is said to have pushed back the intestine from the uterus as late as the third day. Sabatier thinks, that attempt could not be done. In this circumstance, that dilemma solves the question suggested by Pagni, namely, that of opening the abdomen and withdrawing the lower from the place in which it is incarcerated. But there are serious objections to this proceeding. There is no certainty that the intestine is incarcerated, though it were so; the adhesions which are soon formed, would frustrate the design of the operator.

Cesarean has not only been recommended for cases where the child has passed into the abdomen through a rupture of the uterus; it has likewise been advised by instances, in which the fetus has grown in the Fallopian tube, away, or cavity of the abdomen. Here, indeed, the operation deserves to be called Cesarean; for, in addition to the situation in the tube and cavity of the abdomen, it is necessary to open the pouch in which the child is contained. The instances of conception in the Fallopian tube are not uncommon. These in the uterus and cavity of the peritoneum are more rare. Singular conceptions, that rest of the uterus reported to be of the lower kind, if strictly examined, would have been found to be in reality conceptions in the Fallopian tube.

Extra-uterine conceptions hardly ever arise at maturity. However, the fetus found in the Fallopian tube has elements here known, to attain the form of nine months, and then die, either from the impossibility of its expansion, or from the insufficiency of the nutriment afforded it. The pouch in which it was contained, and the neighboring parts, have then inflamed, and after becoming extremely congested by morbid effusions, have ruptured. The abortion has taken place, partly at some point on the circumference of the tube, and partly into the rectum; and the dead fetus has been discharged perineal with the "water."

In other examples, the fetus, instead of giving rise to the abortion, has become entangled with the enveloping membranes, and retained in this state many years, without any other inconvenience to the patient than what depended on the size and weight of the tumor within the abdomen.

Next frequently, however, the pouch containing the fetus bursts about the middle of the ordinary period of gestation, and the third passes into the cavity of the peritoneum. At the same moment, the blood-vessels supplying the surface of the containing parts usually pour forth into the abdomen so much blood, that the patient generally die in the space of a few hours.—See a case by Dr. Clark in *Trans. of a Society for the Improvement of Medical and Chirurgical Knowledge*. Also another, advertised by Dr. C. Hall, in *Med. Clin. Trans.* vol. 4, p. 243.

Two facts of this kind fell under Salazar's observation. The woman was in the end of the ninth month of pregnancy. Excepting a swelling, which affected only one side of the abdomen, and frequent dragging pains in this cavity, there was no evidence of any thing extraordinary. In other respects the patient was well. They were both, all on a sudden, attacked with extremely acute pains which lasted two or three hours. A most violent effusion that the rest was followed by entire ease. The abdomen swelled, and he was, as it were, flat. Atypical morbid warmth diffused itself over this part of the body. The skin lost its color. Almost continual syncope occurred. The pulse was feeble and uncounted. The whole body was covered with a cold sweat, and the woman died. The rapid course of these symptoms rendered it impossible for Salazar to be of any service. The patient was actually dying when he was called to attend. The examination of their bodies evinced, that the abdomen contained a large quantity of blood; that the intestines lay on the intestines, connected with the late-mentioned Fallopian tube by means of the uterine artery; and that the tube itself, which was strongly congested, presented as other tissues, except that which depended on the afterbirth.

There is nothing that approaches an extra-uterine pregnancy with sufficient certainty to justify any positive conclusion respecting the nature of the case, before the ordinary time of parturition. In many women the general blood inclines to one side, and uterine congestions become more dragging pains, which may depend upon other causes. Things, however, are different when the fetus has lived to the ordinary period of parturition, and the woman is attacked with labor-pains; because, besides the unambiguous signs of the presence of a child in the abdomen, the vessel is empty, and is little changed from its common state. Should women, like Salazar, have recourse to the Cæsarean operation, just as if the fetus were in the womb? But we are sure, that the peritæum which contains the child, will contract itself like the uterus, and thus the incision which is in contemplation, will not give rise to a fatal hemorrhage? Would it be easy, to separate and remove the whole of the placenta? How could the placenta, analogous to the fetus, find an outlet, and would not its extravasation in the abdomen be likely to prove fatal? Salazar thinks, that the risk which is to be encountered, is equal less when things are left to nature. The child, indeed, never survives a period. It will either give rise to abortion, with which it will be discharged in the uterus, or it will remain for a length of time in the abdomen, without any urgent symptoms. Salazar also advises attention to the great premonitions of an infant's life, and expresses his opinion, that there can be no safety in deciding what could easily be avoided. Happily, practitioners are not often placed in circum-

stances as Salazar, and extra-uterine conceptions mostly perish before the end of the common period of gestation. We have then only to attend the efforts of nature; rather by promoting expunction, if it should seem likely to occur, by making a suitable opening, in enlarging one that may have formed spontaneously, by extracting such fragments of the fetus as present themselves; by breaking the bones when their size and position there in the uterus, are likely to be an obstacle, where the abortion takes into the rectum, and lastly, by employing suitable injections.—(*Salazar, Of Accidents Operative*, c. 2.)

An extremely remarkable case of extra-uterine conception was related a few years ago by *Wagner*; the woman having at length passed into the bladder by all exertions, and caused such affliction we rendered assistance into that measure indispensable, with the view of extruding the parts of the fetus lodged in it. The operation was done above the pubes; but the internal mischief already existing was so great, that the patient did not recover.—(*Vierteljahrsschrift Naturforsch. der Medicin*; *Rastatt*, 1823, nos.)

Grove, p. 411, relates a case of ventral conception, in which instance the Cæsarean operation was done, in the child preserved. A lady, aged thirty-one, had a tumor in the groin, which was at first supposed to be an epiplocele, but an unusual pulsation was perceptible in it. In about ten weeks the swelling had become as large as a potato of bread. Grove, assisted by the lady, opened the tumor. He first discovered a sort of umbilical sac, whence issued a gulf of a length of three feet. The sac was dilated, and a foetus fetus found, about half a foot long, and large in proportion. It was perfectly alive, and was baptised. After tying the umbilical cord, the placenta was found to be attached to the parts just behind, and near, the abdominal ring, but it was easily separated. Grove does not mention whether the mother survived; but the thing would not be very surprising, considering the situation of the fetus. *Bertrand* says, he was unacquainted with any other example of the Cæsarean operation being done, in case of extra-uterine fetuses, so as to save both the mother and infant. This eminent man considered opening, in such cases, as the greatest that the physician could not be acquainted from the viscera, in which it might be done, or, if left behind, it could not be drained, without such inflammation and suppuration as would be mortal. But if, in addition to such objections, says *Bertrand*, the operation has been proposed by nature, and promoted by nature, we may conclude, that this depends on the difficulty of judging of such progressions, and of the time when the operation should be attempted. His opinion of the question the difficulties which have been indicated the containing dead portions of the fetus, and the fetus's case, who operated without expecting it met with a fetus at all.—(*Bertrand, Traité des Opérations de Chirurgie*, chap. 5.)

Whatever the Cæsarean operation, or pessary, has been performed, the practitioner is not unreasonably endeavor to prevent inflammation, and the wound, and approve any antiseptic symptoms which may arise; he should also prevent upon the mother to suckle the child, or order that the lacta may not be too copious; and, after the wound is healed, she should be advised to wear a bandage, for the purpose of limiting the extension of a ventral hernia, of which, according to *Wagner*, there is a considerable risk.

The following case of extra-uterine conception is here inserted as being particularly singular in its kind. As such case is to be found referred to in *Wagner's* *Art. Med. Digest*, see in any of the numerous periodicals which contain the profession. It occurred in the person of Mrs. Corrie and Harlow, of Georgia, and was communicated to Prof. Parvins, of New-York. The subject was a negro woman, aged 35 years. On the night of the 23d of Jan. 1829, she was taken in labor. There occurred no doubt that she had arrived at the full time of labor. Her labor-pains ceased, she was attended to for a few days for dropsical symptoms, after which she suffered greatly. On the 3d of February, she was again taken in labor. The pains, however, immediately entirely ceased, and after five weeks she expired. On examination after death, the following facts presented themselves. In the first place, Mrs. Harlow and Corrie drew off from the abdominal firm and a half-gallon of an extremely turbid and bloody fluid. On opening the abdomen, the first thing that

presented itself was the child, climbing itself across the abdomen; its head in the right, its feet in the left, hypochondriac region; its back immediately to the left-thigh of the mother. It was as large a child as that of three had ever seen at birth, and perfectly formed. The circumference of the neck alone, about six inches in length, and inserted into the shoulder when without the intervention of a placenta. The uterus was about the size of an orange; its coats very tough thickened and inflated, with a small quantity of a thin bloody fluid within its cavity. The abdominal viscera were all diseased, save the bladder. The liver retained its normal shape and position, but looked more like a mass of glue than a soft solid organ. The spleen had gone into a state of complete ossification. As to the stomach, there was not the slightest change left. The bladder appeared to be the only viscus that had escaped unscathed from this disposition in nature. The lungs had simply adhered in one solid mass from the stomach to the uterus, and to the posterior and lateral portions of the abdomen.—(*See New-York Med. and Phys. Journal*, vol. i.)

The case of extra-uterine fetuses in which Dr. Mackenzie of New-York operated with success, is often referred to.—(*See Lond. Med. Society's Trans.*, vol. 6.) This interesting case confirms the views of those who believe in the entire production and perfusion of the human fetus extra-uterine.—(*See Taylor's Med. Biography*.) But even this opinion is not confined to the United States, and therefore does not detract from the claims of Mr. Richardson, who opened the uterus itself.—(*See the preceding note*, p. 221.)

Gastricmy has been performed for the removal of extra-uterine fetal several times in America, with complete success.

Mr. Wm. Baylis, of Virginia, member of the Royal College of Surgeons, London, succeeded as early as 1776, in removing an extra-uterine fetus from the abdomen, after it had lain there two years. He thus preserved the life of a valuable woman, who was otherwise would have fallen into the grave, with hectic fever and the most distressing symptoms.

In 1798, he repeated the operation with the like success on a servant woman of Mrs. Washington, Fairfax Co., Virginia. In the publication of these cases in the *N. Y. Med. and Phys. Journal*, vol. 1, Mr. R. has performed a valuable service to the profession, in the judicious remarks with which he accompanies the report.

In the same work, Dr. J. Anthonio Smith, now Professor of Anatomy in the University of New-York, has published a case in which he performed this same operation in fact, in the city of New-York, with the most satisfactory result. I have not been able to find any other cases of success in this operation in this country, except those of Dr. Mackenzie, Mr. Baylis, and Professor Smith, and must refer to the journals I have named for their interesting details.

The following cases of Cæsaræan operation, are extracted from the *N. Y. Med. and Phys. Journal*, vol. 3, for 1822; and as two of them were well performed, and the other accomplished by an illustrious female surgeon, they will be found interesting to a high degree. The recovery of these women should be regarded as extraordinary events, rather than as astonishing encouragement easily to attempt this great and dangerous achievement.

In the *Memories* of Jan. 26th, 1822, says Dr. S. M'Chesney, I was called upon by Mr. Ripps of Nassau, to assist with Dr. Bauman in the case of a servant girl, who, having been in a dangerous situation, had been removed to his house, and found the patient to be a girl sixteen years of age, one month black. She had a fine pale complexion of 18th or 19th years. Dr. R. informed me, that she had a wound in her abdomen, near the centre of the epigastric region, from which he had extracted a full-grown fetus, that was in part perfused, together with a considerable portion of her intestines. The placenta having two twisted cords attached to it, he had removed from the same office, and had also introduced her hand into the uterus per vaginam, &c.

In examining I found an irregular incision of about four inches in length, extending in a diagonal direction, as regards the abdomen, about two inches above the umbilicus, and an incision of about two inches in length nearly a right angle with the former, extend-

ing towards the sternum. The lower part of the abdomen was considerably distended with blood.

Observations were in the first place directed to the examination of the blood contained in the abdomen, which was partly effected by a change of posture and slight compression. "We then brought the lig. of the uterus in contact by the interrupted suture, dressed it with lint soaked with emollient ointment, and secured the whole with a broad bandage. After administering an anodyne, we left her for the night. I did not see her again, but was informed by Dr. R. that she never had any very violent symptoms.

The second day he bled her, gave her a cathartic, and pursued the antiphlogistic regimen a few days, when the febrile excitement abated. An ordinary dose of food was then resorted to and in a few weeks the patient was perfectly recovered.

The circumstances attendant on the solution of the wound were these. While the lady was at dinner, she went a distance of perhaps fifty rods from the house, and placed herself on a snow-dripping fence, where she was first discovered by her master in the act of covering something with snow, which afterward proved to be a naked child. As soon as she perceived that she was observed, she immediately ran to the house, with the second child hanging on at the waist, together with a considerable portion of her intestines; led by her nose and large vessels, which were the instruments she had previously prepared for the operation, and shortly began to complain.

I should judge from the appearance of the blood upon the snow, these being three several places where she evidently stepped, that the incision was made hurriedly proceeding the rupture of the membranes, and that the first child was contained per viam naturalem, the third pain after the rupture.

As many of the greatest discoveries in every department of science are made by accident, or without any particular pre-arranged design, may not the conduct of this desperate girl give a useful hint for an improvement in the Cæsaræan operation, consisting in a division of the uterus diagonally, near the fundus, instead of the ordinary method?"

The following is the case of Anne O'Neal, inserted in the *Medical Essays and Observations* published by a Society in Edinburgh, by Mr. Duncan Stewart, Surgeon in Glasgow, in the county of Tyrone, Ireland.

Anne O'Neal, aged about thirty-three years, with a poor father near Chesham, and mother of several children, in January, 1793, took her infant pains; but could not be delivered of her child by several women who attempted it. She remained in this condition thirteen days; the child was judged to be dead after the third day. Mary Donnelly, an illiterate woman, but sensible among the peasant people for extracting dead births, being then called, used also to deliver her in the common way; and her attempts not succeeding, performed the Cæsaræan operation, by cutting with a razor, first the remaining parts of the abdomen, and then the uterus; at the aperture of which she took out the child and membranes. The upper part of the incision was an inch higher, and on a side of the cervix, and was continued about six inches downwards in the middle between the right os uteri and the Anus, after she had the lips of the wound together with her hand, and one went a mile and returned with with and, the constant fluids which issues out. With these she joined her lips in the manner of the Irish exposed ordinarily for the hum-lip, and dressed the wound with water of eggs, as she told me some days after; when, led by curiosity, I visited the poor woman who had undergone the operation. The age was estimated with accuracy of the patient's own recollection.

In about twenty-seven days, the patient was able to walk a mile, on legs, and came to see my father's house, where she showed me the wound covered with a vesicular; but she complained of her belly being distended towards the right side, where I observed a tumour as large as a child's head, and showed it distended with the liver, after which I gave her some medicine, and advised her to drink the decoction of the rubicary pines, and to support the side of her belly with a bandage. The patient has enjoyed very good health ever since, manages her family affairs, and has frequently walked to market in this town, which is six miles distant from her own house.—(*Edinburgh Med. J.*)

In the year 1818, a negro woman (belonging to the

and the completion of this substance with the fluid from the vessels.

This state of the scrotum was of several of twenty years' duration, and had been gradually increasing, the tumour increasing as the scrotum increased in size. The extent known to us was of which it could be ascertained.

From its size and weight, as well as the long-term nature of the disease, he became desirous to have a removal if practicable and proper. The health being otherwise good, and the tumour appearing to more than the original nature, but was maintained that the operation should be performed.

An incision was made across the root or base of the scrotum, beginning on each side of the upper part of the penis, at a point a little above the scrotum, so that some enlargement of this part of the penis in a diseased state was also removed, and carried down to the perineum, leaving an irregular portion of the scrotum below at about an inch in length. Continuing cutting through the diseased integuments and the subcutaneous cellular membrane, the capital root of cutaneous was readily discovered and divided. The vessels of the neck were unobscured by extensive dissection, leaving the incision extended on each side several inches. Numerous arteries were cut during the dissection at the perineum, as well as several large veins in the perineal sac.

The perineal portion of the scrotum was covered by a very considerable amount, but it was altogether unobscured by the incision. A few nerves for the scrotum, and only to be cut from the perineal portion. Light feelings of heat, tingling, and a few slight pains applied for the first few days, followed by slight pain in the lower part of the back.

Respiration and circulation being well established, the rest of the operation was finished by the use of various straps.

The complete recovery from the operation, and the reproduction of a scrotum, was not attended by any inconvenience. Three years have now elapsed, and he enjoys excellent health, being occasionally obliged to take for a week or two a few grains of the sulphate of ferrous, to restore the action of his stomach, which, before the operation was performed, threatened to become an organic disease. — *Doyle*

CALCULI IN THE INTERIOR OF THE EYE.

See Eye, &c.

CAL-CIN, *new bone*, or the substance which grows in and cements the ends of a fracture, and for the production of bony matter.

1. The old surgeons believed callosities to be a bony transverse concrete, a thin, porous, red bone, the extremities of the fractured osses, which was soon hardened into bone. They always described it as an "enlargement of the bony part," and imagined that it issued from the ends of broken bones, in this form, sometimes too profusely, sometimes too sparingly. The rupture of bones, bones, and the breaking of callus, they compared with the gluing together of two pieces of wood, or the welding of a broken pot. — (*J. Ford*). They also conceived, that callosities sometimes flowed into the joints, so as to form a piling, permanent protuberance. They imagined that callosities were a space which constituted a dangerous period of time, and they therefore had fixed days for removing the bony part of each particular fracture. They supposed, that as callosities might be expressed by a firm and well-colored bony, and its bony substance covered by pillars and compresses; that it might be softened by fomentations and oils, so as to allow the bone to be set again. All these notions were mistaken; and their absurd doctrines have been the source of death to the thousands of patients, from Hippocrates down to Dr. Allen and Mr. Gooch.

2. By Gooch and Dehaene, however, a second doctrine was established, which treated the formation of callosities as the production and secondary bony, which were supposed to be two solid pieces, and the fracture, the substance between them being absorbed.

3. A third opinion, maintained by Blandin, and the last modern authority, is, that the process of nature, in the production of callus, bears a great resemblance to the changes which take place in the union of the soft parts.

A bone is a well-organized part of the living body; that matter, which keeps its vessels parts together, is of a gelatinous nature. The phosphates of lime, in which a bone owes its firmness, is deposited in the interstices

of the gelatin, undergoing a constant change and renovation. It is incessantly taken up by the absorbents, and secreted again by the vessels. It is this constant absorption and deposition of earthy matter, which keeps the bones firm, and enables it to grow with the growth of the body. It is this increasing activity of the vessels of a bone which enables it to resist itself when it is broken or dislocated. In short, it is by various forms of new secretory process, that bone is formed at first, is supported during health, and is renewed in all cases of very ossification. Bone is a secretion, originally deposited by the arteries of the bone, which arteries are constantly employed in growing it. Callosities are not a vascular growth, deposited merely for filling up the interstices between fractured bones, but it is a superabundance of bone and perfect bone, furnished with arteries, veins, and nerves, by which its earthy matter is continually changed, like that of the contiguous bone. Indeed, there could be no connection between the original bone and callosities, were the latter only the inorganic concrete, as it was formerly supposed to be.

Notwithstanding the more accurate opinions now entertained concerning callus, the expression is still very common, that the slightest fracture will destroy callus, while it is being formed. But, says Mr. John Bell, it is an ignominious error, proceeding merely from the state of the parts and having little or no effect. For, when callosities form, the perfect constitution of the bone is restored; the arteries pour out from each end of a broken bone a gelatinous matter; the vessels by which that gelatin is secreted expand and multiply in it, till they form between the broken ends a well-organized and animated mass, ready to begin anew the secretion of bone. Thus, the ends of the bone, when the bony secretion commences, are merely in the same condition, as soft parts which have recently adhered; and it is only when there is a want of consistency in the tissue, or when a want of elasticity makes inequalities, then these remaining their secretions, that callosities are imperfectly formed. Thus is the reason why, in certain constitutions, is patients affected with syphilis, or pregnancy, or fever, or in any great disorder of the system, or while the wound of a compound fracture is open, or callosities are prevented. — (*John Bell's Principles of Surgery*, vol. 2, p. 560, 561) There are some of the latter statements in conflict, or not, will be seen in the article *Fractures*.

For some time the secretion of earthy matter is interrupted; the young bone is soft, flexible, and of an organization suited for all the purposes of bone; but lacks the delicate and unobscured; not a more concrete, like the crystallization of a salt, which, if interrupted at the moment of forming, will never form, and leads to the decomposition of a slight accident, and to be entirely destroyed by being even roughly moved or shaken. In perfect callosities in soft and yielding; it is figurative in its composition, so that it is not very hardy injured, and in its organization it is so perfect, that when it is hurt, or the bony secretion interrupted, the broken bone heals, just as soft parts adhere, and thus the callosities become again entire, and the process is unobscured.

In consequence of the above circumstances, if a bone is broken a second time when the first fracture is nearly cured, the bone suffers more easily than after the first accident; and Mr. J. Bell, even asserts, that when it is broken a third and a fourth time, the bone is still weaker. In these cases the bony growth, it is true, is still greater. In these cases the bony growth, it is true, is still greater. In these cases the bony growth, it is true, is still greater.

Callosities are said to be more vascular than old bone. Mr. J. Bell mentions an instance of a bone, which had been broken twelve years before he reported it, yet the callosities were colored singularly red. When a recently formed callosities is broken, many of its vessels are destroyed, but some are only elongated, and it is very large, that its whole substance is torn. It is easy to control, or modify the continuity of the vessels will be restored in a broken callosities, when we reflect on its great vascularity and the vigorous circulation excited by the arteries in vessels already accustomed to the secretion of bone. These vessels state why a broken bone callosities is more readily united than a fractured bone.

While the ends of a broken bone are connected together by a flexible substance of earthy matter, callosities, Dr. Blandin calls this bond of union the pro-

This odorless and destructive disease enters the most important parts, wherever their nature may be, to enter into the system of action. The skin, the cellular membrane, the muscles, and the peritoneum, all become affected if they are in the vicinity of cancer. This very striking circumstance demonstrates, as we have seen, says Mr. Abernethy, from several other theorems. In what the author calls *circulatory cancer*, the disease is propagated along the absorbing system; but the parts immediately in contact with the diseased glands do not assume the same diseased action. Neither is the tabulated system from the disease spread along the skin, but destroys that part only which covers the diseased glands. According to Mr. Abernethy, a disposition to cancer existing in the surrounding parts, before the actual occurrence of the diseased action, may be a circumstance noted by Mr. Hunter, since from the following rule in practice: That a surgeon ought not to be satisfied with removing merely the diseased or actually diseased part, but that he should extract every more part of the surrounding substance in which a *diseased disposition* may probably have been seated. In consequence of this communication of disease to the contiguous parts, the skin soon becomes ulcerated, and attached to a cancerous tumor, which in the manner is fixed to the muscles or other part over which it is seated.

As a carcinoma tumor increases, it generally, though not invariably, becomes tropical upon its surface, so that this inequality has been considered as characteristic of the disease. A festering pain is common; but it is not experienced in every case without exception. It is also a symptom attending other tumors, which are called *carcinoma* in situ, and it cannot, therefore, be deemed an infallible criterion of the nature of the disease. (*Laboratory's Surgical Works*, vol. 2, p. 39, &c.)

A hard and painful glandular swelling, having a disposition to become cancer, says Hunter, is the essence, the analogue and strenuous denotation of scirrhus. The disease is not regularly attended with swelling; sometimes scirrhus parts diminish in size and shrink. Scirrhus is not a characteristic property; the many tumors which are not scirrhus, are exceedingly indurated. The disease is not always seated in a gland; it frequently attacks structures which cannot be called glandular; and hard glandular swellings are not often seen, which are not parts of scirrhus. The disposition to cancer cannot be interested among the marks of scirrhus, since it is not discoverable till carcinoma has actually commenced. Its formation is not an inevitable occurrence; and other causes become carcinoma in which we can hardly say the term scirrhus. (*Laboratory's Surgical Works*, vol. 2, p. 39, &c.)

With regard to the observation that carcinoma is not a essential character of carcinoma, Mr. Bell says that in carcinoma only in a certain sense. "It is true (says he) that there is not always an increase of the dimensions of the whole breast; on the contrary, true carcinoma is often accompanied with a contraction and diminution of the general bulk. But when it is true of the breast or mamma is not true of the tumor; for the proper structure of the gland either shrinks or is diminished; and sometimes the surrounding fat is diminished or absorbed, so that the whole mass is less than the natural breast, or that what the breast was before the commencement of the disease. But still the diseased part is properly a tumor; there is no use in treating mass, a preternatural growth, or new mass, corresponding to the old definition, *carcinoma* signification. But harder, and as respect to the above mentioned fact is not always diminished in carcinoma tumors, but sometimes (says the contrary; and this difference is not without sometimes (proceeds a variety in the extent of the tumor, which there is some in the disease actually in the internal structure. Sometimes, thus the diminution of fat, the irregular tabulated structure of the disease will be apparent to the eye and to the touch; while in another patient the breast will be large, soft, and smooth, only marked more than usually with large blue veins, and having as clear like a new day in the eyes of the breast." (*C. Bell, in Med. Obs. Pract.*, vol. 12, p. 223.) These observations fully agree with those which were mentioned in the communication of cancer have needed the to

Scientific surgeons ought undoubtedly to have a disposition mounting when they employ the term scirrhus; the word is generally used more vaguely; and, perhaps, influenced by its etymology, surgeons call an extensive number of various morbid infestations scirrhus, which are not all of a malignant or cancerous character.

I have always considered scirrhus as a diseased hardness, in which there is a propensity to carcinoma, therefore, and a greater likelihood to become that state in any other kind of diseased hardness, although the skin may occasionally not break during life and a few scirrhus infestations may have been removed.

Though Hunter states that the disposition cannot be removed till carcinoma has actually taken place; though Mr. J. Hunter and Sir E. Home affirm that other infestations and tumors may terminate in cancer; though Mr. Abernethy states that scirrhus and every other tumor may and is not malignant, and such an equal cancer is actually (J. Hunter, *Works*, p. 33); yet it is now well ascertained that in all these instances, the changes which precede carcinoma are distinct from the scirrhus or the state of a true malignant scirrhus.

The coloring of the skin, the dull, leaden color of the integuments, the knotted and matted feel of the disease, the continued stinging pain in the part, the fixed attachment to the skin above, and muscles beneath and in the breast, the retraction of the nipple, form so striking an assemblage of symptoms, that when they are all present, there cannot be the smallest doubt that the breast is a scirrhus, and that the disease is about to acquire, if it have not already acquired, the power of communicating the surrounding parts and the lymphatic glands in which the absorption of the diseased part takes place.

As Sir Everard Home has observed, the truly scirrhus tumor, which is known to be capable of changing into the true open cancer, when allowed to increase in size, is known to be hard, heavy, and connected with the gland of the breast, and, when moved, the whole gland moves along with it. The structure of a scirrhus tumor in the breast is different in the various stages of the disease; and a description of the appearances exhibited in the three principal ones, may give a tolerable idea of what the changes are which it goes through previous to its breaking, or becoming what is termed an open cancer.

When a scirrhus is made of such a tumor at an early stage, provided the structure can be seen to advantage, it presents the following appearance: the center is more compact, harder to the feel, and has a more uniform texture than the rest of the tumor; and is nearly of the consistency of cartilage. This middle part does not exceed the size of a silver penny; and from this, in every direction, like rays, are seen ligamentous bands of a white color and very narrow, leading to the section, like so many extremely irregular lines passing to the circumference of the tumor, which is bordered with the substance of the surrounding part. In the intersection between these bands the substance is different, and becomes less compact towards the outer edge.

On a more minute examination, numerous ligamentous bands, of a lighter appearance, form a kind of net-work, in the meshes of which the new-formed substance is enclosed. This structure accords with what Dr. Baillie describes as presenting itself in cancerous diseases of the stomach and uterus.

In a more advanced stage of the tumor, the whole of the diseased part has a more tabular structure; no central part can be distinguished; the external edge is more defined and distinct from the surrounding gland; and the ligamentous bands are different directions are very apparent, but do not follow any course that can be traced.

According to Mr. C. Bell, it is like ligamentous bands which produce the retraction of the nipple, by contracting between its ducts and destroying its spongy texture. (*Med. Obs. Pract.*, vol. 12, p. 223.)

On dissection, Mr. Astley Cooper observes, that the breast is now solid mass like cartilage, with very little vascularity except at its edges, and internally dense. When the breast has acquired any magnitude, however, there is generally an opening in it, in which case it has the appearance of being from within and empty. In the progress of the alteration it is very vascular, and bloody before it is not with. The absorb-

every kind of emotion, this, excite, irritate, excite, &c., and the integuments become affected before the distention produced by the size of such swellings becomes very considerable. In some cases, the skin may become congested, discoloured, and pained.

Some tumours may be harder and denser than a few scirrhi, but otherwise it is exactly the same.

As every induration and tumour may assume the cancerous shape, and even end in cancerous degeneration; and as some true scirrhi, when not irritated by improper treatment, may continue stationary for years, the occurrence of actual cancerous events proves that the preceding rule was that of scirrhi. The only criterion of the latter disease is derived from the assemblage of characters already specified: we trace the peculiar pecking, and speedily notice discoloration of the skin, as other appearances, considered separately, bear any trace of discrimination.

The white ligamentous bands around a scirrhus form a very characteristic mark of the compound, at least as it appears itself in the female breast; but these bands do not extend till the disease has been removed. Hence, the probability of taking away a considerable portion of the substance, surrounding every scirrhus tumour. Were any of these white bands left, the disease would inevitably recur.

Mr. Pearson has observed that with an imperfect proof of a primary swelling in an abscessed gland, and (says he) if a longer experience shall confirm this observation, and establish it as a general rule, it will afford mutual assistance in forming the diagnosis of this disease.—(*Pract. Observ. Medico-Chirurg. Complément*, p. 2.) Sir E. Home, however, has given the following:—If an abscess which seemed to form in the breast, is not of the fungiform shape, situated between the nipple and the axilla.—(*Obs. on Cancer*, p. 105.) The position laid down by Mr. Pearson, that when the disease originates in these glands, it is rarely to be met with a cancerous matter, may yet be generally correct.

OF CANCER IN THE STATE OF ULCERATION.

According to the observations of Mr. Abernethy, the diseased skin covering a cancerous tumour of the breast, gradually elevates before the swelling has attained any great magnitude; a large tumour is then produced in its substance, rising by a struggling and partly by an insidious process. Sometimes, when cells contained in the tumour are by this means laid open, their contents, which are pulpy matter of different degrees of consistency and various colours, fall out, and its external base becomes more and more elevated. The discharge takes place with a velocity which would almost induce belief, that it was hardly removed from the process of secretion. When the diseased substance, as it were, exhausted themselves, an attempt at reparative efforts to take place, similar to that which occurs in healthy parts. New flesh is formed, constituting a fringe of granular tissue, as a periphery of the diseased centre by which it was produced. This diseased fringe occasionally elevates scirrhi. But though the centre of the disease are thus enlarged, though they may in for some time increase and increase, they never cure, nor does the part ever become healthy.

In the very white, the disease extends through the surface of the absorbing vessels. These glands become affected at a considerable distance from the original tumour. The progress of carcinoma is an insidious and gradual in the sense in that which has been already described. The disease is unaccompanied from any gland or inflamed surface till all the cellular structure is affected. Some regard to under the cutaneous, at the lower part of the arm, and lower part of the chest, become discoloured. Occasionally, a stria or two become elevated higher up in the arm, and frequently one of the course which the absorbed fluids would take. As the disease continues, the absorbed glands, in the situation of the diseased tumour, gradually become affected. In the advanced stage of carcinoma, a profusion of small tumours, similar in structure to the original disease, form at some distance, in so become a kind of irregular scirrhi nodules.

The most frequent observation is with nodes, the pain and erythema which the disease induces, accompanied by the contraction which it assumes with the formation of

absorption in those parts in which the vessels leading to the diseased glands belong. Towards the termination of the disease the patient is generally affected with difficulty of breathing and a cough.—(*See Abernethy's Surgical Works*, vol. 2, p. 72, &c.)

The general condition of the patient is vividly described by Mr. C. Bell. After mentioning the hectic fever which precedes her, he observes, "The countenance is pale and anxious, with a slight hectic heat; the limbs have become pinched, the eyes and nostrils slightly well; the pulse is frequent; the pains are severe. In the lung tumours the pain is stitching or sharp; in the opposed surface it is burning and severe. When the lungs are exhausted, entered near the body, especially in the back and lower part of the spine; the legs and shoulders, &c. Successively the glands of the body, and those about the already become diseased. Some pains about the arm of the arm at the axilla, in which an abscessed system, and has no connection. At length, there is a cessation and weakness of digestion. A locking cough sometimes occurs. Several scirrhi swell through the skin; the pulse becomes rapid and thready; the surface indurated; the breathing anxious; and so the end."—(*Med. Ess.* Trans. vol. 12, p. 223.)

One of the most deplorable effects occasionally resulting from cancer is, in most a finality of the tumour that those of the backbone, known by the most infrequent nature, as merely scirrhi in fact, Mr. Astley Cooper mentions several examples of this fact. In the collection of St. Thomas's Hospital in the thigh bone of a Mrs. Edge, which broke out her merely rising in bed; and also the thigh bone of another cancerous patient that was fractured by her falling in bed.—(*Lectures*, vol. 2, p. 184.) Other cases are recorded by surgical writers.—(*See Prolegomena* Oration.) It seems that the carcinoma indurata is deposited in the structure of the bone, as the scirrhi of Mrs. Edge above mentioned fully illustrate; and in the reports at St. Thomas are two curious specimens of diseased bone, in which a scirrhi of the bone is absorbed, and without inferiorly deposited in the space produced by absorption. In the first specimen of carcinoma, described by Mr. Abernethy, the part is peculiarly hard, and rarely admits considerable magnification. He states, however, that there are varieties, and speaks of another case in which the indurated carcinoma was not only pale and glassy, and a specimen in the first was the least in this state, not doubt whether the disease be several stages of carcinoma. The extension of the tumour is also much less hard than in the specimens first described; yet it is more compact and heavier than most other diseases of the same kind which are not carcinoma. If the history of the disease accords with that of carcinoma; that is to say, if it begins in a small distinct and regularly, and insidiously, around its periphery, and gradually, and insidiously, around its periphery, leaving produced in various parts nodular projections, knobby, the disease will almost invariably be found to be carcinoma. The skin will soon adhere to one or more of these projections; it will thicken and expose the subjacent parts; and the future progress of the disease will accord to that of the harder and smaller specimen, except that the abscesses are much less liable to be affected.—(*Id.* vol. 12, p. 223.)

The edges of a cancerous ulcer are hard, ragged, and irregular, very painful and painful in different ways, being sometimes turned upwards and backwards, and on other occasions forwards. The white surface of the ulcer is usually irregular; in some parts there are considerable elevations, while in others there are deep excavations. The discharge for the most part is a thin, discoloured, frothy, and is often composed of such a degree of acrimony as to corrode, and even destroy the neighbouring parts. In the most advanced stages of the disease a good deal of blood is often lost from the diseased vessels. A burning heat is invariably felt over the elevated surface; and this is the most tormenting symptom that attends the disease. These shooting, burning pains, which are generally very distressing in the local state of the complaint, become later a great deal more so. Normal blood and nervous fluids are not always situated in glandular parts, the situation of such some fluids some assimilation in the diagnosis; for as there are many cancerous affections of the bone and of the brain, as in all the rest of the body, &c.—(*Id.* vol. 12, p. 223.)

of a traumatic cause, it has been observed, however, "that we scarcely ever see glands diseased and of the course which the absorbed matter would naturally take, though they are affected in this manner in diseases which may be propagated by contagion."—(Alcock's Surg. Works, vol. 2, of *Transactions*, p. 75.)

Undoubtedly there is some connection in elderly persons; but, according to some writers, in the young coming from the disease. Mr. J. Barnes has seen it frequently noticed and attended with a fatal issue. In children of five years old, he sometimes took instances of the eye being affected in such manner, though, from the late observations of Mr. Warton, we may more reasonably suspect that these examples were really cases of cancerous nodules. An instance, in which a cancerous character of the breast began at the age of fifteen, is related by Sir E. Home.—(Ibid., on Cancer, Art. p. 26.)

Mr. Astley Cooper has frequently seen the disease at all ages between thirty and seventy. He does not recollect seeing less than two cases in which the nature of the tumor was decidedly scirrhus. In persons under thirty years of age. He has seen one case in a patient aged thirty-three; another in an individual of eighty-two; and he has treated an abscessed scirrhus from a person seventy-three years old, who got well. According to Mr. Astley Cooper's experience, the disease does not speedily occur above the age of fifty. The majority meet with it between thirty and forty, and often called scirrhus, he says, are only simple chronic enlargements, not deemed to require active, and not requiring removal.—(Lectures, &c. vol. 2, p. 185.)

Age makes a great difference in the whole class of cancerous tumors; and as Mr. C. Bell has remarked, the same disease distinguishable by various signs will run its course rapidly, and with every symptom aggravated, in a woman of thirty-five, while it will remain stationary for years in a woman of sixty or seventy.—(Med. Clin. Trans., vol. 12, p. 116.) Mr. Astley Cooper also states that when it occurs in very advanced age, it is slow in its progress, and does not in general shorten life.—(Lectures, &c. p. 255.)

According to Mr. Astley Cooper, married women, who bear six children, and single women, are more subject to this complaint than such as have large families. He thinks it very probable that the natural change which the breast undergoes in the secretion of milk has some power in preventing this disease. But he admits that the circumstance of a woman having large children is not a perfect security against the complaint; and he knew one individual with this disease who had been pregnant seventeen times.—(Ibid., vol. 2, p. 272.)

This gentleman's experience confirms a remark made by other writers, that grief and morbid anxiety seem frequently to have a great share in the production of scirrhus of the breast.—(Ibid., vol. 2, p. 273.)

TREATMENT OF CANCER.

Cancers have sometimes been supposed to be a general disorder of the system; sometimes merely local affections. This is a point of much importance in practice, for if cancers are originally only local affections, no operation can be made to relieve them. They who think that cancer is a constitutional disease, will have much less confidence in the operation, which they may even regard as useless, perhaps fatal, inasmuch as it may convert a local into a general cancer, or bring on the affections in some other part.

Some practitioners, however, reject the doctrine of cancer depending on constitutional causes; and Sir E. Home's comments, in opposition to the opinion, have been laid before the reader. When cancer breaks out again in the same part, after the performance of an operation, it is often owing to some portion of the disease having been dissipated left behind, so as the operation having been just of no use. How likely it is that some of the cancerous disease may be left terminated by the operation, is obvious on considering the manner in which the white bands, resembling flowers, shoot from the surrounding fat, and that when the fibres of the mammary glands are cancerous become also generally affected. After operation, it may be allowed that the disease is supposed to be all apparently so destroyed, and consequently removed, as no recurrence may be feared, perhaps with equal probability, as the continued operation of the same unknown cause which originally produced the first cancerous mischief. Mr. Astley Cooper said lately after very experienced men,

both of the past and present time, consider cancer as decidedly a complaint connected with a peculiar state of the constitution. But if this be true, it may be asked, how can any cure be expected from the removal of the part, as the continued operation of the same constitutional cause must necessarily re-produce it? And as they sometimes do, as already mentioned, the effect of the accident of any portion of the disease not being completely removed with the knife. However, experience proves that the operation frequently affords a relief cure, and another surgery is afterward attended, which is unquestionably a proof of the recurrence of a scirrhusous body; a case in which frequently no other part is afterward attacked, though the constitution is changed.

From the description which Mr. Astley Cooper has given of the constitution of persons destroyed by scirrhus, it must be inferred, not only that the disease is constitutional, but that the hope of radically curing it, either by medicine or an operation, being very often laid in advanced cases. He says, that a scirrhus in the breast is generally accompanied by several smaller nodules of the same character in different parts of the mammillary structure. He remarks the depositing of the same disease matter in the axillary glands, and these above the clavicle. On the left side, he says, the latter sometimes press upon the separation of the thoracic duct. According to his observation, the glands behind the cartilages of the ribs, when the disease is on the external side of the nipple, are generally diseased. The axillary glands on the other side of the body he has also seen in the same state. The lungs are often found enlarged, and adherent to the pleura; scirrhus is infused in the pleura, and the pleura itself studded with scirrhusous nodules. He also describes the liver, stomach, uterus, and bowels as participating in the morbid change.—(See *Lectures*, &c. p. 185, and 4.) Under such circumstances the utility of any treatment must be obvious.

Half a century ago, the accounts given of the results of operations for cancers were so depressing, that they deterred many patients from undergoing a timely operation; which for cancerous complaints, is the only remedy with which we are as yet acquainted, offered to such patients. As Mr. B. Bell remarks, the great authority of Dr. Alexander Monro must have had an insuperable influence even with practitioners, in making them much more backward in undertaking the extirpation of cancers than they otherwise would have been. "Of near sixty cancers," says he, "which I have been present at the extirpation of, only four patients remained free of the disease at the end of two years; three of these lucky people had scirrhus tumors in the breast, and the fourth had an ulcerated cancer on the lip."—(Edin. Med. Essays, vol. 3.) Dr. Monro also observes, that in those in whom he saw the disease relapse, it was always more violent, and made a quicker progress than it commonly did in others on whom an operation had been performed. Hence, he questions, "whether ought cancerous tumors to be extirpated, or ought the palliative method only to be followed?" and, upon the whole, he concludes against their extirpation, except in such as are of the scirrhus kind, in young healthy people, and have been occasioned by trauma or other external causes.

More modern experience, however, has afforded a very different result, and given ample encouragement to the early performance of an operation, and even to making an attempt to cut away the disease, in every instance, both of the local and ulcerated kind, when such a measure can be so executed, as not to leave a portion of the cancerous mischief behind.

Mr. Hall, in 1776, published some valuable remarks on the present subject. At that period, he had extirpated from different parts of the body eight or nine scirrhus cancers, which were all ulcerated, except four; and all the patients, except two, recovered of the operation. Of the first forty-five cases, only six proved cancerous; in three more the others broke out again in different parts; and, in a fifth, there was the reappearance of scirrhus tumors, at a distance from the original disease. These cancers, however, did not appear till three years after the operation; and the woman was carried off by a fever before they had made any progress. All the rest of the forty-five continued well as long as they lived; or, as he says, Mr. Hall, at this day. One of these survived the operation thirty years; and eleven were then

sized, although the last of them was cured in March, 1871.

If the next thirty-three, one lived only four months; and, in five more, the disease broke out afresh, after having been once healed. The reason why, out of forty-five cases, only four or five proved successful, and six, out of thirty-three, was as follows: "The extraordinary success I met with (says Mr. Hill) made numerous patients resort to me from all parts of the country, several of whom, after delaying till there was little probability of a cure, by exhaustion or any other means, forced me to perform the operation, contrary both to my judgment and inclination."

Upon a survey, in April, 1874, made with a view to publication, the readers about thirty. Total cured of different ages, from infancy downwards, sometimes; of whom there were then living thirty-nine. In twenty-eight of that number, the operation had been performed more than two years before; and, it shows, it had been done in the course of the last two years. So that, upon the whole, after thirty years' practice, thirty-nine of sixty-three patients, were alive and well, which gives Mr. Hill occasion to observe, that the different patients lived so long, after the extinction of the tumor, as, according to the bills of mortality, they would have done, had they never had any cancer, or undergone any operation.

The remaining twenty-five, which complete the eighty-two, were cured since the year 1795. Twenty-two of those had been cured at least two years; and some of them, it may be remarked, were severely, and one ninety years old.

In the year 1779, the size of the whole stood thus: Of eighty-eight cancers, extirpated at least five years before, not cured, two; broke out afresh, none; threatened with a relapse, one; in all, twelve, which is less than a seventh part of the whole number. At that time, there were about fifty patients alive and sound, whose cancers had been extirpated above two years before.

Mr. R. Bell, who was present at many of these cures, bears witness to Mr. Hill's accuracy; and the latter very judiciously states, that "from these and many other authenticated facts, which, if necessary, might be adduced of the success attending the extirpation of cancers, there is, it is presumed, very great reason for considering the disease, in general, as a local complaint, not originally connected with any disorder of the system." With respect to Mr. Bell's opinion, that a general anæmia must seldom, or perhaps never, occur, but in consequence of the cancerous virus being absorbed into the constitution from some local affection, much doubt attends even this supposition, though the practical inference from it is what cannot be fought with, viz. in every case of real cancer, or rather in such circumstances, as from their nature are known generally to terminate in cancer, we should have recourse to extirpation as early as possible; "and if this were done soon after the appearance of such affections, or before the formation of cancer taken place, their return would probably be a very rare occurrence."—(Synops. of Surgery, vol. 7.)

Mr. Astley Cooper admits, that the operation is followed by a return of the disease in many cases, the average number of which, however, he does not state, though he says that they do not amount to one-fourth.—(Lancet, vol. 2, p. 263.)

How often is the operation determined upon, because the apple is enlarged, and transverse thereby unaccommodated? Yet says Mr. Charles Bell, with reference to the cause of this change, as previously explained, "it is never clear, that if the apple is fully retracted, and if this has been evident for any considerable time, the operation has been too long deferred."—(Med. Chir. Trans. vol. 12, p. 221.)

Mr. Astley Cooper is adverse to the performance of the operation when symptoms are present; for he has known patients die in two or three days, who had been operated upon while laboring under that symptom. On examination after death, water was found in their stomach, and likewise in the pleura.—(Lancet, vol. 2, p. 263.)

The same experienced surgeon gives it as his opinion, that a breast should never be removed, unless the patient has undergone no course of alterative medicine, no Purgative pills and the subsequent abolition of menses, or (what he prefers) the extinction of ges-

tation with acids and rhubarb. Then the remission may be supposed, and the danger of a relapse diminished.—(Vol. cit. p. 270.)

After comparing the different accounts of cures given by Mease and Hill, well might Richard say: "*Non esse dicendum, de non-voluptatis morbo hæc esse loqui, debuisse fieri potest.*"—(Chir. Clin. Jan. 2.)

MEMBERS AND CLERGY WHOSE NAMES HAVE BEEN CALLED FOR THE FUND OF SCIENTIFIC ACQUISITION.

It is a concerned point, whether a truly cancerous disease is susceptible of any process, by which a spontaneous cure can be effected. It appears certain, however, that a violent inflammation, ending in suppuration, may sometimes accomplish an entire remission of a cancerous affection, and that the more advanced any then be. Facts, confirming this observation, are so occasionally exemplified in cases where cancer is met, and accidental inflammations have led to the same fortunate result, as we may be convinced of by examples recorded by Sir Edward Dimes, Bart., &c. The latter writer, observing to the effect which cancer sometimes yields to red itself of the disease by the inflammation and bursting of the tumor, takes the opportunity to relate the following case. A woman, aged forty-eight, of a strong constitution, was admitted into the Hospital of St. John, with a cancerous tumor of the right breast. The swelling, after becoming softer, and affected with fluctuating pain, was extracted with an incision, which extended to the skin of the part, and of the adjacent cellular membrane. The whole of the swelling burst, and was discharged. A lump, consisting of healthy appearance, remained after this kind of extraction, and lasted in two months.—(Venerable Chir. J. L. p. 263, vol. 2.)

In general, however, it must be confessed that inflammation renders things worse instead of better, and by converting local cancers into violent ones, increases the patient's death, or so all, every means to cure more difficult, and finally any attempts, which, on such a principle, might be made for relief.

Of the general remedies, tartaric, arsenic, opium, belladonna, &c. have been employed with some hope.

Orfila, on cancerous morbidities, gives his opinion on the spontaneous burst of cancer, which has been several times on S. According to him, some persons possess very evident powers over cancer, and has cured a great many cases; but in less regulated habits it has not been found successful; and even in some of the instances adduced by Baron Staudenfeld, it is evident, as he by no means proved that the disease was truly cancer. The public have very little to say in relation to this medicine, as a means of relieving cancer. Mr. J. Barnes declares, that in cancerous diseases, he never knew ketchup produce even temporary relief.—(See Comment.)

Belladonna was highly recommended by Lemery. During its use, he kept the bowels open with castor, administered every second day. The dose should be, at first, a grain of the dried leaves, fresh rubbed. The quantity may be gradually increased to that of four or five grains. The patient is best frequently attended, the dose being first one grain, and afterwards increased by degrees to five. The opinion of belladonna has not been supported by any limited success in cases of true cancer.

Brocton has often been tried in numerous cases, and was highly recommended by the ancients. Mr. J. Barnes says, he has employed it occasionally, without little effect. The constant dose, at first, is three grains of the extract.

Acetous has also been given. And it is a very powerful and dangerous remedy, a patient usually being with only half of a grain of the extract night and morning. Numerous physicians, Paris quacks, physicians, &c. have also been recommended, but they are less readily employed, which is a rational proof of their inefficiency. Mr. J. Barnes tried the 1800 extract of acetous, without any benefit. Barnes prescribed the ferrous sulphate, but without any decided success.

Digitalis becomes vascular system, and may act on both the absorbent, bleeding, &c. It has, however, no specific virtue in curing cancerous diseases.

Opium is seldom employed, with the exception of giving opium, although it is probably a safe and useful agent in cases of cancer, especially when there is much

more frequently used. For the purpose of lessening the pain of cancerous diseases, it is very freely prescribed.

Tonic sometimes improve the general health, but they never produce any specific effect on the local disease.

Ironmedals though arsenic a specific for cancers. Further experience has not, however, confirmed the truth of this opinion, though there are many practitioners who continue to think highly of the efficacy of the mineral in various forms of disease, which have sometimes been classed with cancer; and in many cases of leprosy, and malignant ulcers of the tongue and other parts, it may really produce greater claims to further trial than perhaps any other medicine yet suggested. It is unfortunately such a powerful astringent as to dry the face, lips, and tongue, and in some of the best remedies for leprosy. Mr. Hill observes: "Experience has furnished me with some substantial reasons for recommending arsenic as a medicine of considerable merit, both with regard to solid ulcers and scirrhus, which may one day terminate in that heathen species of ulcer; and although I cannot as yet say it will remove the one, or cure the other, yet certainly and surely as necessary (sometimes) does a separate swelling, or even cure, for it will, in a great majority of cases, retard the progress of the true scirrhus, to destroy, and often prevent its becoming cancer. In some, it has appeared to dissipate such swellings completely."—*Glasg. Med. and Surg. Journ.* vol. 4, p. 38.

Mercury, in conjunction with decoctions of ginseng, kava-kava, &c., has been recommended, but Mr. J. Burns remarks, as far as is now positively ascertained, that that mercury always counteracts the arsenic, especially when in the dissolved state. Plummer's pills and the other arsenical preparations of Dr. A. Cooper, as adjuvants to be given previously to an operation, with the design of lessening the chance of a return of the disease, have been already noticed.

Sulphate of copper also has been tried, but, in general, it retains no character as a remedy for cancer. The same may be said of married harys.

The carbonate of iron was particularly recommended by Mr. Combe. Besides the carbonate of iron, he sometimes prescribed the citrate of iron and potash, and the phosphate, oxyphosphate, and oxyphosphate of the metal. Some practitioners can bear these preparations only in small quantities; they affect most patients with constipation, and many with head-ache and dyspepsia. These circumstances, therefore, must be attended to in regulating the dose. The above preparations have seldom given less than thirty grains, in divided doses, in a day, or exceeded sixty. He prescribes the citrate of iron for internal use, and states, that it cures best in small doses frequently repeated. If chronic be treated with white of egg, have a little pure fixed alkali added, and then be made into pills with powdered lactative. Arsenic is recommended for the removal of warts. When a grain is troscured with a pill containing four grains of carbonate of iron, and taken thrice a day, the constitution will be divided. When the internal use of iron brings on hæmorrhoids, difficult menses, a quick, sometimes full pulse, which is not generally hard and wiry, excessive thirst, hæmorrhoids, &c., and such symptoms become distressing, the iron is to be left off, and four grains of calomel given every fifth day.

At the same time that preparations of iron were internally administered, Mr. Combe had employed externally, the carbonate of iron, the citrate, phosphate, oxyphosphate, and sulphate of iron, blended with water, in the form of a thick paste, which was applied once every third or four hours. To small cancers, the most continuous applied a solution of the sulphate of iron (1 to 8) or water. The solution of iron, diluted with eight of water in weight of water, was also used. The same was used on the part affected by means of diluted iron, 1 to 10, and mixed with a piece of lint with a piece of tape of the cloth.—*See Essay on the Effects of the Carbonate and other preparations of Iron in Cancer*, &c. 2d ed. New York, 1833.

Many remedies have inspired entirely in cases of cancer, because very hot and subacute diseases only supposed to be cancerous, have got well under their use. Such is probably the case with the carbonates of iron.

The only mode of treatment which Mr. Pearson has ever seen do any particular benefit in cancer, is that of keeping the patient on a diet highly nutritious for the support of life, such as barley-water alone, &c., &c. A milk diet has also been recommended.

Will respect to the effects of a very low diet, Mr. A. Cooper is strongly against the plan: if the patient be already weak, he says, you will then render her still weaker, and soon bring her to the grave; in proportion as the strength declines, the pulse is quickened. He further declares, that no power to medicine which has any specific power over the disease, though the state of the constitution may sometimes be improved by Plummer's pills given at bedtime, and the following draught daily. R. Infus. gentian, 15. Tinct. nuxvom. ʒi. Aconit. canth. gr. v. Spts. carbon. ʒss. Mucos. Ulmar. be also regarded as having no particular effect on scirrhus disease. Mr. A. Cooper only sanctions the use of steel trepanning when the disease is confined to the ducts. In such cases, he recommends the compound calomel pill at night, and the following draught twice a day. R. Vin. ferri ʒi. Aconit. canth. gr. vii. Aq. menth. M. ʒi. Tinct. canth. ʒi. ʒss. He also approves of anodynes for the relief of the suffering; as the first, and the lightest opiate, or the black drop, combined with the sugar pill, and a little of the opium extract. One of his patients derived much relief from the following pill. R. Tinct. stramon. gr. i. Camph. gr. i. M. R. pill. He lives in the country.—(*See Lancet*, vol. 2, p. 107.)

The old surgeons commonly dressed cancerous ulcers with arsenical applications. Venetian red ointment dipped in the juice of the solanum; while others employed a mixture with the oil of rose and preparations of lead and mercury. Others had recourse to the hyposulphate; but of late years leeches have been used, the famous iodo-calcic application; and in many cases, as Mr. J. Burns observes, they have undoubtedly checked pain and retarded fever; but this is all which can reasonably be expected. His thinks cancer patients better than those of leeches, as they possess a more active and more powerful system.

Dr. A. Cooper has no confidence in the utility of evaporating lotions. When applications are too extensive as ulcers, the dressing which he mostly prescribes, is a plaster, made by blending ʒi. of the extract of belladonna with ʒi. of soap ointment. When inflammation is present, he does not object to the use of leeches. All local applications, as well as internal medicines, he considers as merely palliatives, unassisted by any power of curing really scirrhus diseases.

The issue of cancers, having been thought to resemble that of the subluxation of joints (over of salivary), and the operation of the issue being the best agent for decomposing and destroying such swell, it has been recommended as an application to cancerous warts. It may correct the fever; but it will never accomplish a cure. Carbolic acid has been used not only to correct the fever, but in some instances, completely to cure the disease. It was long ago proposed, says Mr. J. Burns, by Ferrius, and was lately brought forward by Dr. Ewald. Experience, however, has not shown that the efficacy of carbolic acid, in cases of cancer, is very great. Ferrius remarks, "After the first application, the cancerous sore appears to become a more favorable aspect; the scales which drive from it become thicker, thicker, and purer, and the flesh has a redder and fresher color; but these flattering appearances are fleeting, for in they continue long, the necessarily returns to its former state, and its progress goes on as before the application." The best method of applying carbolic acid is by means of a shablon, the mouth of which is inserted round the sore with adhesive plaster. The air is introduced by a pipe inserted at the other end.

Sometimes the strongest positive is employed. Iodo-calcic, as a local application, is said to be almost as efficacious as iodo-calcic.

The constant gastric juice, absorbent powders, &c. have been tried, but without any evident good.—(*See J. Burns on Inflammation*, vol. 2.)

Mr. Pearson rejected all internal remedies, as ineffectual in the treatment of cancer, and, in the early stages of the complaint, recommended a method of practice founded on his idea of the inflammatory ex-

fall of the disease. "It is the beginning of serious affections of the breast and limbs, the mode I have adopted of treating every kind, is by incision repeatedly applied to the parts. In this course, however, I have often been interrupted by the rapid inflammation produced in some attacks around the parts where they finished. In these cases I have, I have often used a weak, below I must proceed to the suppuration of them. When the suppuration had not in support the temporary stops, in any of the tumors, in so as affected the circulation, either in, or even probably some well become cancerous, I had have recourse to general bleedings. But whether local or general, permanent for a sufficient length of time or temporary. During the whole course, including such practice, yet the patients have not suffered by repeated bleedings; on the contrary, when they passed a certain time without being cured, they felt a renewal of these symptoms, and of course even enjoyed, desired to be cured again. To this plan of repeated bleedings, I joined a milk and vegetable diet, avoiding wine, spirits, and fermented liquors." Mr. Ponsard used also to keep the belly open, and employ antispasmodic applications.

Of the method of treating cancer by pressure, I have spoken in another work (*First Lines of the Practice of Surgery*, vol. ii.) and therefore in this place I need barely remark, that it is a practice, which none of the best modern surgeons think entitled to approbation.

From the preceding account, we may infer that scarcely any relation is to be placed in any known remedy to plan in any cases of non-malignant, and elevated cancers. The operation is the only rational mode of getting rid of the disease; and to make time, so as to abate the disorder in order to a second degree, merely for the sake of trying various antispasmodic remedies, is conduct unworthy of a more skilful practitioner.

Potency, is early used, it may be right to medicinal of arsenic, various preparations of iron, those of iodoine, and, in general, of the extract of the hydriodate of potash, which Dr. Wagner found capable of dispersing any swelling reputed to be cancerous.—(*See Médec. Mod. June, 1816*.) In France, this extract is also applied to various tumors. Dr. Wagner's compound only eighteen grains of the hydriodate of potash to six drachms of lard, but in France the proportions are as much as two drachms of the first article to an ounce of the second. But the practitioner should beware of destroying too much due to medicines which will in all probability prove analogous to the object for which they are exhibited. Grise is also alleged to have succeeded in transmutation an absorption of the whole of the diseased breast, by applying an ointment, composed of ʒi. of hydriodate of potash, and ʒij. of lard. Mr. Hill, of Chester, has recorded one case, very favorable to the further trials of iodine. The cancer was in the unexcited state. He dressed it with an ointment consisting of ʒi. of the hydriodate to ʒij. of lard, and gave the patient internally thirty drops at a time of a solution of thirty-six grains of the hydriodate in six ounces of distilled water. The result was such astonishment of the disease, that a cure was confidently expected; but, in the end, the ulcer returned in former dimensions and malignant character.—(*See Méd. Mod. June, No. 87, p. 283*.) Upon the whole, the question is what we should generally adopt, as the error and the safest means of getting rid of cancerous diseases. As I have before mentioned, the operation is always indispensable, when every particle of the disease can be removed by it. Even large open ulcers, if they can be surgically cut away, are often capable of being effectively cured.

The removal of cancerous disorders, even in the slightest and most trivial cases, should always be effected with the scalpel, in preference to caustics; the use of which, though it may sometimes succeed by producing a complete destruction of the diseased parts, causes severe agony, and inflicts wounds in the yet existing cancerous and the diseased parts, often renders the cure more complicated, and kills the patients; and this is a very short space of time.

In cancerous tumors, the treatment generally considered as every application of the disease kind, together with the pain and inflammation which necessarily exists, are strong objections. Therefore the remedy, which is chiefly wanted, is equally indispensable. Not one can be more or less suitable except every case of cancerous tumor

with any matter, as just cut with the knife, be with this you immediately give an order respecting the surface surrounding the disease, so as to see and feel whether the diseased parts are completely removed, or whether any portion of the disease remains. With respect to the pain, that of caustics is infinitely greater than tolerable, and more tedious, than that removed by the knife. When caustics also take in destroying every particle of the disease at once, it almost always tends to enlarge, in a very rapid way, the original boundaries of the morbid. For as soon as the method of removing scabs and ulcerated cancers, as Messrs. Boissier & Co.

"There is, perhaps, no disease to which our minds are less," which has likewise faithful of symptoms, it has judged us prone a harvest of wealth and reputation to ignorant and unscrupulous charlatans in the case of cancer, and we give them the evils of amputation in the treatment of this disease, and so find have been the several caustic plasters which are exposed to the public, it is a matter of surprise that such impostors have not been made the subject for the indignation of the patients of our medical order.

Our nation has given us a third and judicious description of the various modifications of cancer, and as much well enable the young student easily to pass out his diagnosis. But his chief difficulty will be to convince his patient and friends that every cancerous tumor, whether limited, or extensive, or even malignant or epithelioid, local inflammation, is not a cancer. These dangerous cancer doctors who swear to cure a vast number, gain their reputation for success by promising all such local affections to be cured, and then applying their cancer-plaster until they have a sore surface which soon granulates and heals by curettement. The cure of cancer is then published, and thousands of certificates, under seals, are deluging the country, it being such cases in patients, many of whom sometimes are completely responsible of cancerous disease in any of its forms. Hence it is that we find many cases being cured in New-York by these impostors than there are cases of the genuine disease in the United States, according to a year that there are observed a cure. Within three years I have known more than a hundred instances of these impostures. Sometimes it takes a nerve material, or an extension by amputation, is treated by a cancer-plaster; and the most mentioned is, in a short time space, that he saw a child with scabs under the treatment of one of these impostors, who had already inserted a caustic plaster beneath the tumor by a caustic application. Very often an impostor goes, on the other side, an obscure theorist, has some airy notions, which had been already discussed in the matter as the worst kind of cancer, although neither possessed any specific character whatever.

All these impostures, however, are comparatively innocent; because, for the most part, they only inflict pain on the skin, and a wound on the pockets of those who become their victims. But they do not without lesser crimes; with their impostures their business-ventures, and they devote every method attached to the structure of the female breast to be a cancerous tumor, and predict the surgeon with his knife, and death in the rear, as the certain results of delay in using on this cancer and its roots. I have known many wives and mothers ruined for life by submitting to the experiments of ignorance and folly in matters of the particular structure, which required, for the most part, no medical attention. And in one instance I saw a poor old, the widowed mother of a number of children, of what is called aneurismal fever, produced by a plaster applied to the mamma, which if occasionally removed, would have existed for years, but which her friends, and her friends, and the wickedness of one of these impostors had changed into a malignant cancer. It was in perfect health when the cancer was applied, the scarlet turned blackish and deep; an unhealthy inflammation succeeded, involving the other breast and the mammary gland, soon which she was soon bedridden, and lingered eleven months, dying at the result of the disease. This is only one among a number of instances in which death has resulted in this city from cancerous tumors.

It will perhaps be expected that I should point, in the place, to the treatment of cancerous tumors by amputation, a remedy which some years since secured a cure

ludens are not infrequent, and when the disease is neglected, extreme sloughing sometimes happens.

Lying is a nearly constant, unvoluntary food, and sometimes to chillsiness, are supposed to be conducive to the disorder. Its course seems not to be unobscured, but it is remarked that the disease prevails most in houses where children are crowded together. The complaint is sometimes suspected to be contagious.

Though children are the usual subjects of it, grown up persons do not always escape its attacks.

The treatment consists in exciting diseased flesh and loose pieces of bone; directing a milk and vegetable diet, with a prudent quantity of sweetened liquors; and prescribing bark, sesquioxide, and cinch bark with sulphur acid.

The best external applications are, distilled rose-water; hyacinth; the doctored carboline, with sulphate of zinc; tincture of myrrh; lime-water, with spirit of wine, &c.—(See *Parsons's Principles of Surgery*, ed. 2, p. 357.)

CANTHA UIDES. Spanish or French fly, with which the common blistering plaster is made. In surgery they are also prescribed in incisions of ulcers, galls, &c. The thimble is sometimes added to strengthen blistering to increase their effect. When applied to the skin or taken into the stomach, they have a powerful tendency to act upon the urinary organs, and especially to irritate and inflame the neck of the bladder, and occasion suppuration. In children, these effects are particularly frequent.—(See *Blister*.)

Under the article *Tincture of Cantharides* will be found some practical remarks on the effects of this remedy in several diseases. I would therefore only remark in this place, although not strictly appertaining to surgery, that the internal exhibition of cantharides will be found to possess extraordinary efficacy as evacuating an habitual propensity to abortion, which the female constitution sometimes acquires. There is known this remedy succeed after almost successive abortions had occurred, notwithstanding all the efforts made to prevent its repetition. It is not should be considered as increasing ones tend strongly to induce, which result may be lessened by applying a dilute tincture of cantharides to a blistered surface.—(See *Cantharides*.)

CAPITULUM. (From *capitulum*, a woman's hat.) A beetle-headed ulcer, the middle of which is applied to the scrofula. After two or three under the redness increases, sometimes upon the forehead and vertex; then, one being reflected over the vertex, to the forehead, the other is continued in a circular track. They meet cross each other upon the forehead, after which the first head is turned back obliquely towards the neck, and reflected by the side of the neck. The last is continued in a circular direction, and the first is brought again over the neck, suture, backwards and forwards, and so continued till the whole head is covered. By the patients this kind of cure sometimes applied in case of hydrocephalus: it has no advantage, however, and is now hardly ever used.

CAPILLARY PNEUMIA. A very minute crack in the skull. The term here refers to its preventing the appearance of a hair.

CAPITRUM. See *Scrofula*.

CARRUNCLE. (From *carrus*, a turning wheel.) An ulcer. This is a very common symptom in the plague, but comes on also sometimes as a primary disease. The first symptoms are great heat and violent pain in some part of the body, on which some one or several excoriations, attended with great itching and a burning heat, follow, which a preternatural but very deep, and extremely hard tumour may be felt. In some respects it resembles the furuncle, but differs from it in having no central core, and in terminating in gangrene under the skin instead of suppurating.—(See *Cancer's Dictionary*, vol. 1, p. 30, *Plutarchus*, 122.) It soon assumes a dark red or purple colour about the centre, but is comparatively pale towards the edges. A better frequently appears on the spot, which, as it increases an intolerable itching, is often scratched by the patient. The tumor being then broken, a brown mucus is discharged, and an excruciating appearance. Many vesicles of the kind are sometimes produced upon one limb.—(See *Med. Lib. vol. 1*.)

Furuncles have been distinguished into the benign and malignant kinds, but as far as the disease can be

judged of at present in this country, the distinction is only decided upon the different degrees of violence with which it makes its attack. Some carcinoma are said to be pestilential, while others are not at all contagious. Periodically, all cases run with this kind are of the last sort; for no opportunities of remarking the pestilential anthers have occurred in England since the fatal periods of 1603 and 1604.

The carcinoma sometimes appears in persons affected with typhoid fever, in which case it is attended with great weight and stiffness of the adjacent parts; the patient is restless and pale, the tongue white, and a deep red, and much; the pulse late, often sometimes pulse, sometimes very faint, with all the other symptoms, in an exaggerated degree, which attend typhoid fever. The patient often complains much of his head, either from pain or giddiness. Sometimes he is delirious; at other times he cannot get the least sleep. Sometimes he is delirious. The case is also apt to be attended with chilliness of figure, and profuse sweats. The patient is sometimes twenty, sometimes affected with a profusion of mucus; he generally complains of loss of appetite, nausea, and vomiting, takes little nourishment, complains of difficulty of breathing, and is extremely low with prostration of the heart, and sometimes lividity.—(See *Amplified Out*, vol. 2, p. 122.)

Sometimes a little slough, of a black colour, issues from the middle of the tumour. This was supposed by the ancients to be a sign of the body toward a cure or hard cure, by the violence of the disease. In some instances, the carcinoma is considered as a sort of gangrenous affection of the cellular membrane.—(See *Cantharides*.) The progress of carcinoma in the puerperal state is generally quick. They run in various; they have been known to be as large as a pail. Considerable local pain and tenderness always attend the disease. The skin, indeed, has a peculiar feel, like that of ivory. As the complaint advances, several operations gradually form in the tumour. Though these openings there is discharged a greenish, bloody fluid, irritable matter. The tumour swelling it often very extensive, even when no sign of suppuration can be externally discovered.

The carcinoma is often so low and talented, that death follows. The carcinoma, indeed, is most frequent in old persons, whose constitutions have been injured by voracious living; and again an opinion is expressed that the local disease, derived by the general disorder of the system, should very often receive a diaphanous aspect.

The degree of pain may generally be estimated by the largeness and situation of the tumour, the number of more swellings at the same time, the age of the patient, and the state of the constitution.

With regard to the local treatment, the great thing is to make an early and free incision into the tumour, so as to allow the sloughs and matter to escape. This, with the view of facilitating the course of the discharge and internal sloughs of the cellular membrane, it is a good plan to remove, with a pair of scissors, a part of the dead skin, as soon as its detachment is sufficiently advanced.—(See *Amplified Out*, vol. 2, p. 141.)

As much of the contents as possible is to be removed, and, and then the part is to be exposed to a constant position. Indeed, until the cancer is opened, no application is more proper than constant pressure, and when an incision has been made, the part is preferably to be exposed to a constant position, made with bark, tincture of iron, &c., or some other made with the sulphates of copper and zinc, nitrate of silver, &c. Incisions are also often made, but both before and after an opening has been made. As the discharge is exceedingly fatal and dangerous, it is to be removed by a fresh position of the part. The use of the cautery is to be considered till all the sloughs have separated, and the surface of the cavity appears red, and in a granulating way, when and let and a plaster of some coagulating matter should be applied, together with a compress and bandage. The incision is to be made in the line of the cancer, in which the disease is to be carried on by making a proper opening in the line of every protrusion, and if any part is to be removed, a frequent removal of the dead portions of carcinoma cases. Mr. Blandin finally declares

surface of the diseased bone, and extends from the slightest caries; while in the soft parts a want generally leads down to the caries, and creates a very firm, dark-colored surface. These symptoms, however, as well as the tendency in the accompanying short or stunted to produce large fungous granulations, are more common in cases of caries than in those of cancer, some of which may remain a very long time without uniting with any external sore, although, as shown in the illustration in the cancer produced by various diseases of the joints. And, indeed, particular forms of caries (if they deserve that name) are rarely accompanied with suppuration: a fact to which I shall again advert.

The absorption of bone, like that of soft parts (says Dr. Thomson), may be distinguished into constitutional, progressive, and obliterative. We have ample proof of the constitutional absorption, or that which is salutary, healthy, and necessarily taking place from every part of the substance of bone, in the deposition and removal of phosphate of lime, that has been tinged with ossification. If too much earth be absorbed, the quantity of animal matter will be relatively increased, and a disposition given to softness of the bones—a state which exists in the bones of children in the disease called the rickets, and in the bones of older people in that denominated ossification ossea, or the rickets of grown people.

I have already had occasion to mention the effects of the progressive absorption of bone, as manifested in the progress of aneurysms and other tumors, to the skin; but the formation of pus is by no means a necessary, constant, or even frequent attendant on the progressive absorption of bone. Hydatids in the frame of sheep, various growing from the pia or dura mater in the human body (see *Nature History*), or abscesses seated over the cranium, or within the cavity of the chest, are often the cause of the whole substance of a bone being removed, layer after layer, by progressive absorption, without the formation of a single particle of pus. (See *Anatomy*.) This state of the bone has often been confounded, but improperly, with that state of the bone which arises from obliterative absorption, the state which is properly denominated caries, and in which one or more sections of continuity may be produced upon the surface, or in the substance of the bone. The abscesses occurring in bones by the venereal disease, afford by far the best marked examples of the effects and appearances of obliterative absorption, or cancer in bones. &c.—(See *Thomson's Lectures on Inflammation*, p. 294.)

Caries has been divided into three kinds, according to the nature of its causes: 1. Caries from external causes; 2. From an internal local cause, where no outward injury of the bone, and no external constitutional disease can be supposed to have produced the disorder, and where the affection can be removed by local means. The caries of the finger-bones from whitlow is regarded as a specimen of this form of the disease. Perhaps, however, the case is generally rather an instance of necrosis. 3. From a general internal cause, or constitutional disease, in which case, besides local symptoms, it is necessary to employ such medicines as are calculated to obviate the particular affection of the system, whence the diseased state of the bone has originated.

But, in addition to these general divisions of the subject, there are many considerations in relation to the nature of caries which may be said yet to be in obscurity. If, as a modern writer remarks, the symptoms of the bones, the nature of their organization, and the structure of their diseases would be an attentive observer trace the formation, development, and progress of caries, no doubt there would be noticed a diversity in its symptoms corresponding to its different species; and probably it would be found that a venereal or syphilitic cause would vary in its origin and progress as much from a poison arising from a purely local cause, as a venereal or syphilitic fever differs from the kind of affection that follows a common abscess. (See *Dr. Sydenham's Med. & S. p. 24*.) The cancerous caries, as it has been termed, which permeates the whole substance of a bone, and gives it an appearance as if it had been bored in hundreds of places, is a very different affection from some other forms of the disease, whether superficial or extending to the deeper trunks of the bone.

Mr. Sydenham regards the distinction of caries into the

dry, moist, cancerous, &c. only as the result of the confusion of caries with other morbid states of the osseous tissue. The dry is in reality necrosis, as already noticed. A cancerous bone, after amputation, according to Mr. Sydenham, looks as if it had been bored; being fissured, white, and more brittle than normal, and is very attended with pain or less excruciating, so as to expose the cellular structure. It usually contains a greenish liquid matter, which has been partially dissolved by the necessary immersion in hot water. (See *Edin. Med. and Surg. Journ.* vol. 36, p. 257.)

Abscesses situated in the vicinity of bones are frequently thought to be the cause both of necrosis and caries. This was the ancient doctrine, and it has many various advocates in modern times, especially Mr. Lisfranc. (See *Edin. Med. and Surg. Journ.* vol. 26, p. 241.) Hence, the rule to open such abscesses at an early period, in order to prevent the bone from being affected, if near abscesses, like those which form over the inferior surface of the tibia and tibiotal process of the temporal bone, is frequently attended with great injury or necrosis, the latter is mostly the cause and not the effect of the suppuration. But, which is a third instance, moderns think, never mistake the end and the means which it is in contact until the question is changed by exposure to the air. When an abscess forms in the osseous part of the process of the abdomen, the peritoneum of that part, internally, thus becomes, instead of being destroyed, because thick and strong enough to resist the extension of the abscess towards the cavity of the abdomen. So also when an abscess is formed over a bone, not irregularly drained or hurt by the same causes which produced the abscess, and not injured by being kept exposed, or by frequent excoriation, applications, either cause necrosis is likely to happen. On the contrary, the peritoneum, like the peritoneum, becomes thickened, and the abscesses are formed over it. In the opinion of Mr. Sydenham, cancerous, like necrosis, is induced directly by the effect of violence. If depends, he says, upon a peculiar morbid action, which is probably in all cases produced by inflammation. "Many people think that pressure, such as that of an aneurysm, causes absorption of bone, and gives rise to an appearance which might be mistaken for cancer by an inexperienced or careless observer, but would never for a moment suppose that any one acquainted with the distinctive characters of the disease. The surface exposed by simple absorption differs in no respect from that which would have appeared if the excavation had been effected by violence. We do not here perceive the hardness, whitening, and brittleness of cancer; neither is there any matter secreted from it; and as soon as the cancer is removed the disease ceases. The effect of pressure is retarding absorption, without inducing cancer, it will soon in these contact cases of aneurysms where internal exfoliation occurs, and the confined pus enters a way for its escape, show the sides of these passages, as produced, the disease as they are called, as it is respect various, or until the healthy action. The usual collection of matter tends to be evacuated by the relief the patient from pain, or prevent swelling of the fluid, but no absorption will be continued of caries being produced by its pressure." (See *Sydenham's Med. & S. p. 258*.)

But though this gentleman thinks that inflammation generally, if not always, produces caries, he recognizes this consequence as not invariably following inflammation of even suppuration. "In cases of compound fracture, suppuration, mortification of parts, &c. we then say we have suppuration and gangrene in the most satisfactory manner. We observe the same thing occasionally in joints, which become ankylosed with being the seat of abscesses." At the same time, Mr. Sydenham believes that suppuration of bone, which either takes place spontaneously, or as consequence of slight external injury, is very frequently followed by caries, much more so than when it results from a vessel which does not lead to the bone tissues.

Mr. Sydenham says that caries seldom affects the bone to a great depth. "There are often not an articulating extremely carious order as when internal necrosis, and even to the center. At other times we find it hollowed out into a cavity, the surface of which is carious, while the internal shell is sound. The very limited extent of the disease often continues remarkably with the extreme obliquity and severity of the symp-

ness. This there is in my possession a right-hand which I took from the body of a woman who had suffered under caries of the tracheal major for thirty-two years; yet the whole disease may be covered by the point of a finger, and is not thicker than a cocoon."—(*Gynec. et Gyn. Med. Jour.*, v. 31, p. 227.)

The vascular disease is sometimes a cause of caries; sometimes of necrosis; frequently of both affections together, and in other instances of necrosis. When it attacks the bones of the nose, its destructive effects arise partly from necrosis, and partly from caries, and the former is fully developed. The bones of the palate are sometimes affected in the same manner, but on a very occasional effect upon them is clearly necrosis.

In cases of cancer of the alveolar the alveolar and the bone sometimes become carious. I believe that in such cases the disease of the bone has nothing to do with the cancer; it is to be regarded as an extension. It is a mere effect of the original disease; and if the cancerous bone could be removed together with every particle of the disease of the soft parts, a cure would probably follow. On supposing the cancer bone would the only portion of the disease left, it is reasonable that the cancer might yet still be cured. At the same time it is proper to remember what has been mentioned in the article Cancer, that Dr. J. C. Cooper refers to his Lectures on some bones taken from cancerous subjects, whose the alveolar substance is deposited in their structure.

Under the article Trachea I have stated a very remarkable case of caries from syphilis occurring in the trachea, together with its successful treatment. The celebrated Richman of Paris, has several times reported various cases, and this operation has since been repeated by Dr. McCallum, of Philadelphia, and by Dr. Hildworth, of Virginia.—*Revue.*

Caries arising from syphilis more commonly affects the ribs, cranium, nose, ear, and maxilla, and maxilla; and I believe is mostly accompanied with a greater or less degree of necrosis.

Caries of the vertebrae is known by peculiar symptoms, among which a paralysis of the inferior extremities (lower limbs) are the most remarkable.

Caries parietis, caries from an external or local external cause is less dangerous than that which proceeds from a constitutional disease, particularly when the latter is difficult of cure.

Caries of the spongy part of the bones is more difficult to cure than a similar affection of the compact part. Caries of the nasal and frontal bones is particularly obstinate. These bones being in close contact, the disease cannot easily be prevented from spreading from one to the other. An operation is often the only means of cure. The disease is frequently the cause when the spongy heads of the long bones forming the large limbs become carious. Even this mode of relief is not reasonable when the head of the bone has very deeply, like that of the os femoris.

Caries of the ossa cranialis that observed to be particularly difficult of cure.

Caries from scabies, the most frequent cause of all the examples of this disease of the bones (Wismann), is more difficult of cure than that from syphilis and scabies; for some efficacious remedies against the latter diseases are known; but scabies cannot be said to be within the reach of medicine. The prognosis is less favourable in old than young subjects, and much depends on the extent of the disease, the patient's strength, and the state of the soft parts.

When caries arises from constitutional disease, internal remedies are of course indicated. Then mercurials and other in medicine put a stop to caries from syphilis; while vegetable and acids cure both the scabby and the caries dependent on it.

According to various indications in the treatment of caries, it is fitted to produce a change in the action of the diseased portion of bone, whereby it may regain a healthy state, or destroy it altogether.

In the case of constitutional caries, the first object seems to be brought about by the operation of such remedies as remove the original disease; and I should not doubt whether, in these cases, any very active local treatment is necessary or free from objection. Of course, this remedy is suited to apply only to caries in which no sound bone, necrosis or plan, which is known to be a seriously case remedy for the general disease. This is not the case in cancerous, scabious, and necrotic, caries, trachea, trachea, trachea, and

local disease, are extensively symptomatic.—(*New Journal and Physician*.) But surgeons have proceeded farther, and not content with issues, blisters, emulsions, &c. as means for quieting the action of the diseased bone, they have constantly recommended applying directly upon it the strongest stimulants, as the tincture of alcohol or opium, a solution of the acetate of nitrate, concentrated vinegar, or diluted nitric acid.

For the destruction of caries, the actual and powerful caustics and cutting instruments have been employed.

On the contrary, and particularly in France, the plan of touching carious parts of bones with the actual cautery, after bringing them fairly into view by the process of the knife, is still pursued. It is thought that the burning iron acts by changing the caries into a necrosis, isolating the diseased sound parts, and causing the action of the vessels, by which the dead or diseased part of the bone would be thrown off. Such is the doctrine (taught by Boyer, and such is the practice) sanctioned by some surgeons of the present day, among whom I find Mr. Lisson.

Mr. Hey succeeded in cutting away a carious part of the tibia. He began the operation by dissecting off the projections of flesh which had arisen from the bone, and then carried on, by means of a circular-headed saw, a wedge of the tibia two inches in length. The removal of this portion brought into view a caries of the cancelli almost as extensive as the piece already removed. With different trephines, suited to the breadth of the caries, Mr. Hey removed the diseased cancelli of the bone quite through to the opposite lamella. As the caries extended in various directions, it was not possible to remove the whole of it with a trephine without removing a large portion of the sound part of the bone, which Mr. Hey wished to avoid. By the assistance, therefore, of a strong sharp-pointed knife, he pursued the caries in every direction, until every part was taken away which had an unsteady appearance. The wound was simply dressed with dry cal, the whole surface was speedily swathed with good granulations, and a complete cure was obtained without any exhibition.

Mr. Hey concludes this subject as follows: "I have treated some other cases of caries of the tibia in the same manner, and with equal success. Where the extent of the caries is not so great as to prevent a complete removal of the diseased part, this mode, it is extremely useful, and far superior to the use of the potential or actual cautery.

The trephine as the wanted where the cancelli of the bone are not affected with the caries. The diseased parts of the lamella may be removed with gouges or small chisels. Granulations of flesh will then arise from the sound parts of the bone, and become united with the integuments, which ought to be preserved as far as is possible."—(*Pract. Obs. on Surgery*.)

Mr. Hey also regards osseous as the best method of destroying carious bone, since he says "more can be done by the saw, or cutting plane, in a few seconds, than by the actual cautery in as many weeks or months," and he strongly objects to the application of the cautery to the bone after the extension of the caries part.—(*Gynec. et Gyn. Jour.*, v. 31, p. 226.) In this point, every judicious surgeon must, I think, agree with him.

Dr. Nuss, surgeon to the Northern Infirmary of Liverpool, has lately published the result of his experience in caries; and he finds that, when extensive is not possible, the most useful efficient treatment consists in applying nitrate of silver to the carious part, and exhibiting the compound decoction of marsh-mallows.—(*New Jour. Med. and Surg. Jour.*, No. 94.)

In the treatment of caries, particularly of that form of it which accompanies white swellings, Mr. Lisson considers blisters and caustics as equally to be productive of much good. In the first or inflammatory stage, he prescribes topical bleeding, followed with moderate, and followed by issues, scarification, blisters, or the medicinal purgative. However, he thinks the most efficient remedy is the nitrate. "In all diseased parts of the joints," says Mr. Lisson, "this remedy affords the most speedy and complete relief, at the expense but of a trifling part of no long duration. The pain does not appear to be greater than that arising from the irritation of an eschar by issues, or any other of the potential caustics, such as lead and during the same

as may be lost when the eye is in various positions. 2. The opacity is somewhat concave. 3. Its contour inclines rather to a pyramid or saddle than to a gray. 4. The degree of the opacity is not at all in a ratio to the degree of opacity; the patient being almost blind. 5. The pupil is more or less dilated; the iris nearly or quite motionless, its pupillary edge being more and there flaring out at night, and otherwise it is somewhat peculiar. 6. Eyes the contrast itself is so pale so faint and transparent in the natural state. 7. The temporary increase or diminution of blindness, sometimes in patients with interstitial keratitis, tends, depends, as it does with interstitial, upon the degree of dilatation of the pupil or the degree of light, but upon causes which need either to depress or excite the system. 8. The opacity which is in the vitreous body, permits persons around the object of a candle, to see a white which is not, but has all the hue of the vitreous; indeed, the flame itself presents these colors, and when the patient goes to some distance from it, it becomes somewhat. 9. At no period of the complaint are operations of any service in enabling the patient to see better. Blind objects are not situated to one side or the other, but are equally seen from those which are distant from the eye. (See *Rees's Lectures on the Eye*, p. 293, 294.) 10. The sight is not temporarily improved by the application of belladonna. (See *Rees's Lectures on the Eye*, p. 293.)

According to this author, the first and most important division of cataract, is into the *senile* and *juvenile*. For the senile is usually, situated in the posterior chamber, between the vitreous humor and lens, and is usually termed a cataract, may be either within the lens of the capsule of the lens, or between the anterior layer of that capsule and the iris. The first case is the senile, the second the juvenile cataract.

A juvenile cataract, when a primary disease, and attended from the first with other mental effects in the eye, is usually a single independent affection, on the contrary, as the senile cataract is generally the consequence of injured epithelium, it is almost always more or less attended with a partial opacity of the anterior layer of the capsule, and, at times, with a genuine cataract.

The first variety of juvenile cataract noticed by Rees is this, which he calls *leucocoria*; it always begins in the centre or very nucleus of the lens, usually presenting a dark, yellowish gray color, which is somewhat deeper at the centre than at the margin of the pupil; a chamber is established even when the disease is in its third complete stage. The leucocoria cataract is always formed very slowly, and, except when the iris is too thick-colored, it is more or less attended with a blackish stain at the edge of the pupil, which may become glaucous as the disease advances. A genuine leucocoria cataract never extends up to the iris or the expansion or contraction of the iris; but does it often in its highest degree deprive the patient of all power of vision, when, in early stages, or when the pupil is beautifully dilated with hyoscine or belladonna, is often capable of distinguishing pretty well many objects which are placed laterally with respect to the eye. A leucocoria cataract is usually, at some distance from the eye, so that the extent of the posterior chamber is manifest, when the opacity presents more or less of a pitted appearance, and never that of very white, dense spots. Frequently, as Rees observes, the leucocoria cataract is associated with any change in the capsule, or the liquor of Morgagni. In most cases of senile cataract, not attended by inflammation, the capsule is said to become transparent. (See *Rees's Lectures on the Diseases of the Eye*, p. 293, 294, 295.)

The second species of juvenile cataract noticed by Rees is *the senile*, which he thinks should also be called *senile*, as the expansion is equal to the eye. The disease seldom commences in the centre of the lens, but usually arises at the margin of the lens of the iris, very white, shining points, streaks, or spots, its color, sometimes, is always very light, and never altogether invisible, even when the disease is completely formed. The dotted or mottled appearance of this cataract is also particularly noticed by Mr. Travers. (See *Rees's Lectures on the Diseases of the Eye*, p. 293.) The blackish ring which, when the iris is light-colored, is more or less evident in this than the leucocoria cataract, is here seen being to the shadow of the iris, but to its dark border; for this cataract is too near the iris for any sta-

low to be formed. This senile cataract, however, is somewhat at variance with what Mr. Travers has observed; he thinks a transparent interposition can be seen as dilating the pupil with belladonna, in his recent case of the capsule cataract; and he believes that the black ring may be confined to the capsule, and not the margin of the capsule. But when the opacity of the lens is different, this sign of capsule cataract. (See *Rees's Lectures on the Diseases of the Eye*, p. 293.) The disease also has some effect on the thickness of the iris, at least in its early stages. A capsule cataract, several authors have the duty of stating, is followed by dilation of the lens itself; a fact, says Rees, which, except surgery, no other means can remedy; it is through the medium of the capsule, that the particles of the lens are incessantly undergoing the changes of renewal and reproduction.

The capsule cataract is subdivided by Rees into the anterior capsule cataract, the posterior capsule cataract, and the capsular cataract, in which both the front and back portions of the membrane are opaque.

The anterior capsule cataract, which is met at all stages, does not extend as long as the lens after it has attained a high degree, but, according to Rees, is more common with an opacity, and, according to Mr. Travers, without any opacity of the lens itself. (See *Rees's Lectures on the Diseases of the Eye*, p. 293.) When the capsule is completely opaque (says Mr. Travers), we can hardly judge of the nature of the lens. But in such examples, "the lens is constantly distinguished in bulk; it undergoes a considerable amount of the opacity, so as to present of itself a brownish translucent cataract. The consequence of the opacity is the dilatation of the vessels of the capsule, from which more of the lens are derived. When the capsule opacity is congested, it is either partly, or wholly, or only a very small piece of lens remains. When the opacity is complete (says Rees), the lens is some greatly reduced in bulk, as appears from the falling in or concavity of the iris, which loses its support, and is demonstrated in the operation. This observation renders the operation with the needle applicable to the cataract in which the capsule is opaque, in cases which are not very recent." (See *Rees's Lectures on the Diseases of the Eye*, p. 293.) In the anterior capsule cataract, according to Mr. Travers, the lens does not generally undergo dilatation, but, for the most part, is enlarged, in consequence of becoming opaque and soft. But he admits, that the process is frequently the case is always, only a small portion of the lens being left, and the rest of the contents of the capsule fluid. (See *Rees's Lectures on the Diseases of the Eye*, p. 293.) The anterior capsule cataract may be known by its light gray and, in some places, completely chalk-white color, observed by staring, another of point the stroke and spots. As the capsule is at the same time the lens is not, the posterior chamber is increased, and the cataract is not infrequently close to the iris, especially when the lens has also completely lost its transparency. In this stage, the membranes of the iris are become rendered less thick, and the shadow at the margin of the pupil is entirely absent. Hence, vision is not only lost, but quite impaired, is termed to my patient's sensation of light, whether the patient be in a light or shady situation; and frequently a kind light is completely insensible to him.

The posterior capsule cataract belongs to the more dense of the disease of the eye; but, says Rees, when it happens, the lens always perforates in the center much more quickly than when in the anterior capsule cataract. Hence the disease is never observed up to the perfect development. Respecting the state of the lens, some difference prevails between the statements of Rees and those of Mr. Travers: the latter gentleman informs us, that when the opacity of the posterior capsule is with which he agrees with Rees in considering as very rare, the lens and anterior capsule are usually transparent; "and when this is not the case, and the cataract except with a posterior side of opaque capsule, it is always accompanied with a considerable dilatation of the lens." (See *Rees's Lectures on the Diseases of the Eye*, p. 293.) And in speaking of the opacity of the posterior capsule, in another work, he informs us, that he has not observed that, in this case, the lens undergoes any dilatation. (See *Rees's Lectures on the Diseases of the Eye*, p. 293.) Like the anterior capsule cataract, it is denoted by a white-gray, or chalk-white color; but no light-colored, chalk-white spots and streaks are ever discernible, which, while the lens re-

time its transparency, may be owing to the distance of the camera from the page. However, the equality noticed behind the page always seems certain when the eye is inspected, not from before, but from every side of it. While the posterior wall of the organ is not absolutely opaque, the retina is practically affected, the strength is only more or less modified, and sometimes, possibly with the aid of a compensating glass, a tolerable degree of vision is enjoyed, notwithstanding the considerable opacity behind the pupil. This system of occlusion has not, of course any influence over the actions of the eye and after the lens becomes opaque, it is not obscured.

Though the complete negative answer is not the final opinion of present ophthalmists, it is rather worth to be very cautious. In relation to the symptoms of the anterior pupillary cataract, it presents few, few factors of characters which indicate it is obviously an interesting; viz. the iris is nearly transparent, the catarrhal conjunctiva is not so thickened, the posterior chamber of the globe is not so filled; and an incipient cataract might really surprise the apprehension of the oculists were object to the fact, unless he obtained them at the contrary by producing an artificial cataract of the pupil with hyaline or corneal clouds. But, though the iris seems more transparent, by the large extent, towards the center it is convex, being and the pupil cut away perceive the strongest kinds of light. Though such is the statement of these, I cannot with Mr. Griffin to the regarding the more darkness, which may attract my large soft cataract, as well as the complete cataract, as, so as to make a consideration of the extension of the latter.—*Operative Surgery of the Eye*, p. 253.

The third species of posterior cataract is the *cataracta Morgagniana*, which sometimes forms a capsule and sometimes coalesces with the posterior cataract. It resembles the rayed form of the cataract, or, more, perhaps, that Mr. Travers regards the same as a partly applied film (*Synonymus of Diseases of the Eye*, 204). The following is the form of cataract described by Morgagni the same; it proceeds from a shallow excavation of the lens into a silky fluid, or thin jelly, frequently attended with a complete capsule cataract. Its origin is said to be always quick, and an immediate effect of chemical action on the eye. The following are the symptoms of the case, while it is unaccompanied with cataract of the broad capsule; a state which can never persist long. Though the colour is dark, white is a delicate amber, the most of diluted milk. The white pupil seems cloudy, but whenever the eyelid moves suddenly and violently, or the eyelid is rubbed over the eye, the opaque substance changed their shape and position. The posterior chamber is mostly unaltered; which may be owing to the quantity of fluid or aqueous substance collected. While the lens and capsule are not essentially changed, the vision suffers only a diminution, though it is very rapid, and small objects cannot be distinguished at all.

When, however, the lens and capsule become opaque, vision is "quite extinct," a certain power of seeing the light being, however, only remaining. Not infrequently, says Herr, when the lens itself is in a clouded state, the capsule is partially opaque, the eye is kept quiet for a few minutes, and the patient stands or sits in an upright posture, two rows of opaque matter can be plainly seen, the upper being the thin white of the two; the lower presenting a darker whitening. Moreover, as soon as the patient suddenly or violently moves his eye or head, or the eyelid is raised over the eye, both these rows of opaque matter disappear, and the cause of the opacity toward the pupil again, are restored.

The fourth species of garden chamber described by Bosc, is the *oxygonolobus* chamber, to which he conceives the figure of Monopson in an altered state may likewise often occur, as may be inferred from the prodigious size of this chamber. It is by no means uncommon, and is attended with the following symptomatic systems. The extent of the cavity, close to the ureter, is partly chalc-walls, partly one that of chalc-walls, and in many places both these cavities may be evidently seen disposed one over the other, thus of chalc-walls, however, being always most superficial. The portion of the eye to the most of light merely causes very motion of the eye, but the pupil is circular, without any angles in it. After the application of the section of laminae or of laminae, the two chambers again expand slowly, and the pupil is long in returning to its

former diameter. Besides the obliteration of the greater diameter, the opening now itself is heavily dilated, in consequence of the true being pushed forward the coccyx by the very large size of the tumour, and hence the protrusion of tube is very common.

The capsule-hypertrophic cataract is not infrequently the consequence of a slow inflammatory process in the iris, the lens, and its capsule; and known several varieties of this case, and an even superficial consideration of a squamous cataract; all which different modifications, says Kels, should be correctly understood previously to an operation, in order to take a just opinion of its nature, and to know what method of operating ought to be adopted.

An opaque vesicle that first in the capsule between cataract, composed with slight depression of the vitreous body, an anterior capsule of the lens. These often degeneration upon the front layer of the capsule, as they only there, put on very different appearances, and occasionally involve various modifications. For instance, the vesicle is sometimes in the cataract, when the vitreous body is formed substances upon the anterior layer of its capsule are so arranged as to resemble the variegated appearance of marble. The vesicle is yellow superficially, cataract, when the vitreous substances move each other, leaving darker-colored inclosures. The vitreous capsule-hypertrophic cataract, when the vitreous matter runs in concentric strata, forming the tubular of eye pupil. The central capsule-hypertrophic cataract, when a single elevated, white, vitreous point is formed on the anterior of capsule, while the rest of the membrane is tolerably clear, and the lens not sufficiently opaque. The striated capsule-hypertrophic cataract, when the front layer of the capsule presents several features resembling depression on its surface. Vitreous cataract, or posterior capsule-hypertrophic cataract, when one-half of the front layer of the vitreous body, mixed with a vitreous pupa. In all these, and some other changes, says Kels, the lens is found to be converted to its very viscous into a crystalline or milky substance.

The second variety of the *Cephus-littoralis* cannot be distinguished by Herr, as the *verrucosus*, indicated by its gray-white color; sometimes lying on stones in the water so as to push the iris forwards towards the apex, and at other times appearing to be at a distance from the iris. These immaturities, by Herr, possibly should always depend upon the position of the body, directed towards and from the water, the vapour, marine animals, globular form, and projects considerably towards the anterior chamber. Frequently, this variety of the *Cephus-littoralis* catenates the head in such a manner the uppermost translucent or shining, and sometimes opacifying, use applied. According to Herr, the extent of such undulations in the catenae is wrong to the broken in very slight contraction of the capsule of the lens with the neighbouring tissues. The same surface has never seen any one of this kind, which had not been preceded by a violent expansion of the outer subjunctive part of the lens. Both layers of the capsule are opaque, and sometimes considerably thickened. The third variety of the *Cephus-littoralis* catenae described by Herr, as the pyramidal or conical, which is one of the rarer types of the *Cephus*, and always brought on by violent intense inflammation of the eye, especially of having the lens, the capsule, and the iris. It may be known by a white, almost shining, opaque, narrow the projecting, new-formed substance, which grows from the centre of the anterior layer of the capsule, and is always in close contact with the pupillary margin of the iris. Hence the iris is always quite immovable and the pupil irregular. Sometimes this growth from the capsule extends itself so far into the anterior chamber, as nearly to touch the inner surface of the cornea, and sometimes actually to adhere firmly to it; a circumstance, says Herr, which is very unusual from casual rubbing of the cornea, though not dissimilar to the lypemias in perforated. The power of admitting light is feeble and imperfect, and sometimes entirely abolished. Mr. Gualini (see I lately) very correctly regards this case as an advanced degree of the disease previously described under the name given by Herr, of (*Opaculatus*). It might, indeed, be mistaken as a species; *catenae*.—(See Gualini's *Opaculatus* in the *Ann. d. Med.*).

The formal variety of the supralaryngeal contact is the salient one. Though principally associated with a vowel

lence chamber, but blended with purities of purulent matter, so as to give it a light-yellowish tinge and a clouded appearance. The pupil is always diminished, adherent to the corneal surface, and smaller; the reticulations fine projects towards the cornea; and not only the strength, but even the perception of light, is completely lost, or the latter at least much diminished.

A rare variety of squamous cataract, described by Beer, is the blood-*cataract*. It arises from some considerable injury of the eye, a large quantity of blood is extravasated in the chambers, and slowly absorbed during the opacification caused by the violence, a part of it, however, remaining in the posterior chamber, in the form of small clots crystallized in the lymph, which was effused during the inflammation; or else in the centre of a more indurated and perfected case of hydrops. Blood is effused in the chambers of the eye, and not mixing with the fluid, still continues in the vessels behind the pupil, after the matter has been absorbed. In the first example, this cataract resembles a reddish web, interwoven with silvery streaks, or flowers; the pupil, though singular, is seldom obliterated; the iris mostly of pale pinkness; and not seldom is the light cherry-colored, but a partial degree of vision sometimes retained. The cataract, in the second instance, the opacity behind the pupil is very dense, white, streaked with reddish or brownish points or spots, having a branched appearance, and frequently projecting through the pupil into the anterior chamber; while the peripheral is very small and singular, the iris quite insensible to motion, and constantly under no perception of light rays, or only a very limited indistinct vision of it. Beer says that this cataract may easily be mistaken for glaucoma, and that an albugo can only be made out with a good magnifying glass.

The double cataract of Schmidt, the *schismatic cataract* of Richter, or the *partial cataract*, as Beer observes, is not one of the most frequent of the squamous cataracts, and is certainly the consequence of a violent compression of the globe of the eye, with or without a wound, whereby a portion of the capsule of the eye is torn, and becomes placed upon the vitreous layer of the capsule, more or less resembling its appearance the schismatic form of the stone formed in dentine. Immediately after such a compression of the eyeball, the patient complains of a serious dimness and confusion of vision. Whoever examines the eye soon superficially, will certainly not discern the poem of the laceration lying upon the eye perfectly immovable crystals of the lens, for the first careful inspection will be necessary for the purpose, and consequent the aid of a magnifying glass will be requisite. But as the lens and capsule are movable at the same time loosened from their connections, they likewise generally become deprived of their transparency, and as soon as this has happened, the displaced portion of the capsule can be readily seen. When inflammation ensues, the flakes of the capsule become closely adherent to the first layer of the capsule of the lens, and even the papillary edge of the capsule acquires the same kind of denseness, so that the perception of light is diminished. But says Beer, when inflammation follows, the papillary margin of the lens remains free, the lens perfectly movable, the light easily distinguishable, though the lens and capsule be entirely opaque, and sometimes the flakes of the capsule resembling the schismatic streaks of the dentine either in shape, size, and position, but never completely detached though they may not connect with in the capsule. (Lectures on the Eye, p. 263, 264.)

A particular case is described by Mr. Guthrie, as more light denoting the name of *choroid cataract*; a young, healthy person of constitution of the eye, in consequence of a few or gradual inflammation of the eye. The pupil shows merely a point, which remains sufficiently free from opacity for light to take place with the aid of spectacles. "On the redness of the inflammation, the iris, by the natural efforts of the part, or under the influence of treatment, is drawn towards the outer circle or circumference, and the pupil is apparently enlarged; but the vision, in consequence, does not improve with its anterior part, or seems affected in the capsule of the lens on considerable portion of its periphery so to prevent the passage of the rays of light through it, while the pupil, as a distance,

seems to be of its natural size and blackness." A minute inspection, however, shows that the pupil is nearly closed. Mr. Guthrie adds, that the operation for closed pupil, by division (the only proper one), is not advisable as long as the patient can see well enough for the common purposes of life. (New Operative Surgery of the Eye, p. 264.)

Another classification of cataracts, which is of great importance to an operator, is that which is founded upon their consistence; for as their consistence, the nature not only a great difference in the common treatment, but also in the choice of a method of operation.

When the opacity (as is often more extended than in the natural state, we require a considerable degree of firmness, the case is termed a *firm or hard cataract*. When the consistence of the lens seems to be softened into a watery or other kind of fluid, being in the eye, the case is considered usually as *fluid cataract*. When the opacity (as is in a softening consistency) has been fluid, but about as consistent as a thick jelly or mucus, the case is termed a *soft or mucus cataract*. When the anterior or posterior layer of the crystalline capsule becomes opaque, after the lens itself has been removed from this eye, the cataract is termed a *posterior cataract*.

The *lenticular cataract*, the *lenticular* and smaller becomes, in this case, the *lenticular* part of the eye, as well as the *lenticular*, or a *lenticular* appearing according to Beer, is *very dark*. The consistence between the cataract and pupil, sometimes, is *firmly* distinct, sometimes *less* from opacity, and, when the pupil is closed, can even place per se, the *lenticular* part. In the *fluid* state of the pupil, a *black* circle surrounding the lens is very perceptible. The *regions* of the eye are the *anterior* and the *posterior* surface of the cataract appears to, without any degree of opacity. (Lectures on the Eye, p. 277, 278. See, also, p. 279, 280.)

Beer says, that it is only the positive lenticular cataract which can be hard, and it is clearly not with it that, *lenticular* persons; but, with regard to the *lenticular*, that all cataracts in old persons are *firm*, and this is frequently confirmed by experience. In cataracts confined from this, and *lenticular*, the lens is sometimes *hard* divided, as hard as wood, such of a *lenticular* grows, color, and with fewest surfaces as far as if they had been compressed. This cataract sometimes has depressed the *lenticular* cataract, and is very difficult to take out completely in an operation, being liable to be mistaken for an *lenticular* cataract. Hence, in order to prevent it entirely, the pupil should always be dilated with *lenticular* or *lenticular*.

To the *lenticular* cataract, Beer refers several *lenticular* cataracts, namely, the *lenticular* and *lenticular*, or *lenticular* cataracts, that in which helps the *lenticular* or *lenticular*, the *lenticular* cataract in particular, and the *lenticular* cataract, which has *lenticular* partly *lenticular*, as well as all the varieties of *lenticular* cataract. (Lectures on the Eye, p. 280.)

The *lenticular* cataract has usually a *lenticular*, and *lenticular* spots and streaks, diffuse in color from the rest of the cataract, sometimes observable on it. These are *lenticular* and *lenticular* and *lenticular*, when frequent and diffuse masses of the *lenticular* or when the eye is *lenticular* and *lenticular*, sometimes also these spots and streaks are *lenticular* and *lenticular*. The lower portion of the *lenticular* cataract is *lenticular* than the upper, probably because the *lenticular* and *lenticular* part of the *lenticular* had not descended to the bottom of the capsule.

The *lenticular* lens, as it leaves the *lenticular*, *lenticular* acquires an *lenticular* size. Hence, the *lenticular* is *lenticular*, and the *lenticular* cataract is *lenticular*. Sometimes, the *lenticular* cataract is *lenticular* between the *lenticular* and *lenticular* of the pupil. In *lenticular* cataracts, this opacity is usually very much *lenticular*, and the *lenticular* moves slowly and *lenticular*. This opacity (because we cannot see the *lenticular* and *lenticular* cataract). The *lenticular* cataract is sometimes of such a *lenticular*, that it prevents the *lenticular* and *lenticular* part of the *lenticular* to be *lenticular* it assumes a *lenticular* appearance. Patients who have *lenticular* cataracts, generally *lenticular* light from *lenticular* very *lenticular*, and sometimes *lenticular* at all; partly, because the cataract, when it is *lenticular*, lies so close to the iris, that few, or no rays

cases preventing the formation of cataracts in the approach of age; also, and lower than strong fires, as furnaces and stoves, in glass-blowing, &c. To England, little credence given to these opinions.

But says, that he has also noticed the occasional observation, that exposing the eye to the action of concentrated acids, sulphuric and nitric, and sometimes better as a cataract; a substance which will be recorded in this account with some illustration, when the vapour of ether has been occasionally recommended for the dispersion of opacities of the lens and its capsule. The dose of ether is now supposed to be confined to the aqueous, vitreous body, and to be dropped among the vitreous in drops and drops. Mr. Keen, says, I remember that the cataract has mostly been the result of inflammation.

Whether of the eye, where the aqueous has poured the capsule and the lens, and especially violent inflammation of the capsule of the globe or of the eye, though no record may exist, are in general followed by a cataract of an extensive character. This is the case, says Keen, even when an inflammation arises from the injury, the cataract often occurring in a few hours, and on an exceedingly a degree as to admit of being removed.

The cause of cataract thus rapidly produced must depend, in every opinion upon the complete separation of the lens from its connection with the capsule, and not necessarily in part upon the denudation of the capsule itself from the neighbouring textures, for in both cases the membrane also gradually becomes opaque.

According to Keen, cataracts frequently arise from a slow, insidious inflammation of the capsule and capsule.

With respect to the progress, it must be evident from what has been proved, that there are many cataracts in which the cure is highly problematical, and often in which the responsibility of restoring vision, even to the slightest degree, may be produced with absolute certainty.

With the above positive information which surgeons possess concerning the origin of cataracts, scarcely any operations can ever be undertaken of curing opacity of the lens, and its capsule, by means of resolution, so as to separate all division for its operation. A possibility of success, as Keen remarks, can exist only when the cause of the cataract is superficial, and of complete removal, and the disease is in an early stage. And he has observed from several and repeated trials, that the attempt to cure an incipient opacity will never succeed, except when some other, and various general or local action of a curable nature has been a chief cause in the production of the opacity of the eye; as, for instance, scrofula, in a mild form, syphilis, &c. and the sudden cure of venereal, or old ulcers of the legs, &c. is a slow tedious inflammation of the iris and capsule of the lens. In some examples of this kind, Keen could only check the further progress of the opacity, and even when the opacity was improved, it was never rendered perfectly clear. And when the opacity was so far advanced and quite developed, with the exception of the general improvement of the health, and an improved state of eye, whereby it was put in a better condition for the operation, but the slightest benefit was deemed too uncertain. (Keen, &c. p. 122.)

In this country the best is put in force, between opposing the constitutional influence of inflammation, and scrofula, syphilis, &c. in the production of cataracts, except when with general causes directly cause inflammation of the eye, and opacity of the lens, or its capsule is brought on as a consequence of such inflammation. Indeed, Mr. Keen mistakes that scrofula inflammation is rarely produced by the action of the eye, and that syphilis seldom is not more subject to vulgar than other individuals, an opinion in which I perfectly coincide. He also remarks, that there is an evidence of syphilis, patients being particularly liable to cataracts, and this even when they have suffered severely and frequently. It seems to me, however, because the proof of this and other constitutional diseases is to respect the formation of an opacity of the lens and its capsule, and the inflammation of the eye is caused by these (see therefore *History of the Eye*, p. 241), a statement which I think is altogether to every fact, required to be so daily corrected.

The principal external causes that have been tried for the cure of the cataract are, leeching, cupping, scarification, vesication, blisters, and leeches, and the chief internal remedies are opium, castor, nuxvom, calomel, mercury, and mercurials. Formerly, preparations of opium, calomel, and mercury, leeches, and blisters were violently extolled as specific for the disease.

Scrofula asserts that he checked the progress of a cataract by applying to the eye the oil of a pine, mixed with sugar; and Scrofula himself of having successfully tried for this purpose the oil of the yew-tree (see *History of the Eye*).

Calomel and leech have been used in various patients with a cure of cataract. Probably, however, many such cases might have been more operative if the system, or, at least, only transiently operative if the capsule, or disposition of the capsule posteriorly, the consequences of existing or previous inflammation. Whether played to remove the disease, as the power of any remedy to dissolve a cataract, and so to be and removed this tendency in various instances, he has confirmed by declaring that internal remedies, either of the venereal or any other kind, are inadvisable in the cure of this disease; and equally so, whether the opacity be in the capsule or in the vitreous, whether incipient or advanced.

Although the late Mr. Ware coincided with Keen and Keen is agreed by the uncertainty of all causes in the capsule, or even to prevent the progress of such opacity when open to light, yet, according to his observations, many cases prove that the powers of nature are often sufficient to accomplish these purposes. The opacity, in particular, which is produced by external causes, Mr. Ware had frequently seen dissipated in a short space of time, when no other part of the eye had been hurt. In such cases the crystalline lens is generally absorbed, or is removed by the body which is absorbed from very recent glasses. In some of these cases, though the crystalline lens has dissolved, the greater part of the capsule remained opaque, and the light was transmitted to the retina only through a small aperture which had become transparent in its centre. Instances are also recorded, in which cataracts formed within the vitreous, have been suddenly dissolved in consequence of an accidental blow to the eye. The remedies which Mr. Ware found more efficient than others, were the application to the eye itself of one or two drops of ether once or twice in the course of the day, and occasionally rubbing the eye over the lid with the point of the finger, first moistened with a weak solution of myristic liniment. While Mr. Keen admits that opium, percolation behind the eye have been cured under a course of medicine, he considers such cures very rare, and to have been accomplished only when the opacity arose from such disposition in the capsule, the result of sympathetic inflammation rather than from any affection of the crystalline itself. A business of the opacity, caused by the extension of inflammation of the iris to it, he says, may almost always be removed under the treatment proper for the cure of iris; but he does not believe that an opacity of the lens, distinctly dissolved like such, has ever been removed by medicine. He expresses his decided opinion, that if any leucular cataracts have really been cured, they were cured by external violence, and disappeared in consequence of their absorption in the aqueous humor, and direction of the vitreous, the opacity of the lens having been the result of a rupture of its capsule. Mr. Ware, who in the case proposed that the best cataracts might be cured by systematic application, and particularly the posterior eye, lately discovered this opinion; and it would seem from a note in the third edition of his book on the cataract, that the power has published in the first and second, and so proceeding from an external injury, since of the late description. (History of the Eye, p. 241.) At about the same time, a note is inserted as the only means affecting any rational hope of restoring the sight of persons afflicted with cataracts.

Notwithstanding also the prohibition to touch the operation, with all its different modifications, it really benefits, improvement will not always result in vision; say, says Keen, it is frequently accompanied; and even as inevitable since the power of the

retina. Richter and Wenzel make mention of these peculiarities, and the latter refers the phenomenon to the eye deriving its nerves wholly from the lamelliform ganglia, which are immediate signs of sight in considered entirely by another distinct nerve. Hence, the loss of the eye is not an adequate criterion, as authors have argued (Waller), that the retina is endowed with sensibility. Relating to this subject, Mr. Jones has made a curious remark; we attended, in conjunction with Hry and Jones, five children of a clergyman at London, near Boverly, who were all born blind. The voices, "Sweet dreams and luminous light from darkness, and although the pupil is, in darkness, whether the sense itself be connected, and has perhaps, yet these do not seem to depend upon the blind cannot be any wonder."—*Med. Obs. and Inq. vol. 6.*

The reciprocal sympathy between the two organs of sight is so strong, that as one, patients in various other physiological or pathological knowledge regarding them, sight, for a moment, is brought. Hence, in the examination of cataracts, a test of the highest importance is, keep one eye closely occluded from the light, while the surgeon is examining the state of the eye in the other; for the luminosity of the eye of light upon one eye, sensible in this cataract, is known to be the evidence in various extraordinary cases of the eye in the instance any attempt in the state of perfect darkness. In some instances of cataract, the pupil may be quite contracted, and yet sight, although somewhat, the performance of an operation.—*Wenzel.* There are two circumstances, however, which may prevent us from ascertaining whether the retina is sensible in light or not: the first is, a similar affection of the crystalline lens to the eye. Here Richter thought this circumstance might be formed of the nature of the case by observing the changes between the cataract and pupil; inferring that when the eye is between the pupil and cataract was accommodation, such an affection had intervened, and when the cataract did not seem particularly close to the pupil, and yet the pupil could not diminish light from darkness, that it was contracted with accommodation. The second circumstance, sometimes entirely preventing the success of any light, is the healthy retina, is the pupil, every form of the cataract.

But although the power of distinguishing light from darkness is more satisfactory than vision of the lens, it is not an unambiguous test of the retina being perfectly free from disease. While the cataract is in the process, the patient can yet distinguish light and the existence of cataract. Distortion of the pupil is also a doubtful criterion of the complication of cataract with the cataract. When the cataract is large, it is affected by the lens, the pupil is frequently much dilated, though the optic nerve may be normal and sound; the pupil often contains quite undisturbed a perfect cataract serum.—*(Richter.)*

From all this it must be inferred, 1st, That the irregularity and inconsistency of the symptoms of cataract serum, together with the possibility of partial states of the cataract rendering the patient utterly unconscious of the existence of light, make it necessary for the surgeon to be particularly attentive to the appearance and to the history of the original progress of the disease, as well as to understand the real condition of cataract serum. 2dly, That when the patient can distinguish light from darkness, though the eye may be motionless, there is good ground for trying an operation. Possibly in this circumstance an almost unerring rule might be found; but the phrase of the defect of the lens arising from other causes; the certainty that the optic body may be removed from the cataract of light (even if the sense of the cataract be removed, eye sight can be restored), and the impossibility that an operation to cure the cataract will render the other eye sight at all less susceptible of a cataract attempt. Frequently, the patient has a fully-formed cataract in one eye, which prevents the signs of accommodation, while an injured cataract, or even a cataract detached, exists in the other, which at present is free from some symptoms: In this case (says Mr. Travers), the cataract of the latter should be removed without delay.—*(Syncope, vol. 6, p. 214.)*

The conventional testimony of almost all writers upon the subject tends to prove, that the restoration of sight has sometimes been effected in the most hopeless cases; and I am therefore of opinion with Mr. Jones, that in

all doubtful cases an operation should be tried as a remedy by no means violent or hazardous.—*Med. Obs. and Inq. vol. 6, p. 227.*

I shall conclude this part of the subject with extracting the sentiment of Mr. Travers, viz. that it would be incorrect to say that the operation is unnecessary in all cases of cataract in which the patient has no sense of light; for it is possible that the density of the lens may be such as absolutely to exclude the light, and that the nature of the iris may be therefore preserved; or from some degree of firmness of the lens or adhesion of the iris to the capsule, that the pupil may be normal, and the appearance of the iris perfectly normal. But, undoubtedly, says Mr. Travers, a sense of the cataract is indispensable. "A strong sense of light by which he used to know the direction in which it enters the cataract, is a sensible of the falling of the eye, and of a globe, as the latter for eye, sense, corresponding to such a corresponding freedom of motion of the pupil, is a most favourable sign for the operation."—*(Synopsis of the Diseases of the Eye, p. 215.)*

As it is not infrequently happens that cataracts produced by external violence spontaneously disappear (*Part. Med. vol. 1*) the operation should not be too hastily recommended for them.

Regarding the question, whether an operation ought to be done when only one eye is affected with cataract, and the other is sound, some difference of opinion generally exists.

One reason assigned by the adherents of this principle, viz. that one eye is sufficient for the sustentation of life, is but of a physical description; and another, that the patient should never be able to see distinctly after the operation, by reason of the difference of the focus in the eyes, is a third ground for believing only a gradual improvement, inconsiderably transmitted from one eye to another. In support of this third last advanced, and to prove that cataract does sometimes, probably in general (if for other causes of failure exist), attend the practice of removing and extracting, when only one eye is affected with a cataract, I refer to a case reported by M. de la Motte.—*(Treatise de Maladies du Œil, 1^{re} Part, 1741, 12mo. Obs. sur une Cataracte, p. 180.)*

Barth Wenzel was the habit of extracting cataracts with the least successful result, when only one eye was affected with the disease, as may be learnt by referring to the cases here specified.—*Cases, 8, 13, 16, 17, 18, 20, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.*

Richter was warmly convinced, that the advice not to operate when there is a cataract only in one eye, ought, for several reasons, to be disregarded: he reminds us of the wonderful consent between the eyes, so that one is seldom damaged without the other, sooner or later, falling into the same state; and hence he questions whether it may not be possible to prevent the loss of the sound eye, by a timely operation? An aim cannot point further distant with respect to cataract and cataract surgery.—*(Obs. Clin. June, 1741.)* He refers to the remarkable case related by St. Yves where a man was wounded in the right eye by a small shot, and shortly afterward had a cataract in it; he then gradually became blind in the left, but soon recovered his sight in it, after the cataract had been extracted from the right eye. Three let us notice, that St. Yves (*Medicine des Vues, chap. 13, art. 2*) makes no mention of any confusion in vision, in consequence of the different refracting powers of the two eyes in question. From several such publications, indeed, it would appear, that, in a few instances, an artificial cataract in one eye has actually disappeared of itself, after the operation had been performed by a surgeon on the other.—*(Recueil, in Med. and Physical Journ. vol. 12; and Mémoires de l'Acad. des Sciences, 1750, No. 27, p. 221.)* This is a circumstance which is urged by the latter physicians, not only as a strong reason for dispensing the cataract operation, that a cataract should never be operated upon while the other eye enjoys mental strength, but as a powerful testimony that the operation even in many cases so that if there been cataract in the other eye, the operation may be the means of preventing its formation, or if it be already beginning, the chance of its removal by the effect of the removal of the other cataract may be taken. In the *Medical and Physical Journ. de May,*

1838 is also an ingenious paper, defending the practice of operating upon only one eye as sufficient. Another reason, judiciously suggested by HENRY (Edin. Chirurgical Journal, &c.), for encouraging the above proposal, is, that in waiting until a cataract forms in the other eye, the existing one, which is at that age, perhaps, in the most favourable state for the operation, may undergo change so much for the worse (for instance, it may contract such adhesions to the iris) as either to destroy all prospect of relief, or even, afford but a very precarious and discouraging one. The length of time necessary to wait is also uncertain and various. I have seen a case in Mr. HENSLAND'S Hospital, who had had a cataract in one eye fifteen years; during all which time the other contained phlegm, and another case of twenty years' standing has lately been communicated to me. It is right to say, that HENSLAND lately suggested a contrary opinion to remove the cataract, yet without specifying the particular state which induced him to revoke his former sentiments. The principal reason stated by him is, that the patient op. only does not see much more actively with the two eyes, after the operation, than with one before it, but he frequently sees more confusedly, because the eye that has been operated on cannot so well sustain the aid of a glass, which perhaps the sound eye does not require. (Edinburgh Review for November, Driller, &c., p. 184.)

When I remember that our eyes are supplied by this system to contract the muscularity of the former cataract, when I also reflect upon the facts recorded by MILLER, JARVIS, and WARD, I return to my former opinion that Catarrh is necessary, as the noble ground of the advising the contrary opinion, that all our simple instances of this disorder have been accompanied, without questioning from what immediate cause the failure grows, there appears to me much reason to believe that the advice not to operate when there is only one cataract, and the otherwise to operate, so at least a subject which merits further investigation. WARD'S opinion is similar to that expressed by HENSLAND; he writes, "the eye from which the crystalline lens is removed cannot be restored to a degree of perfection at all equal to that of the sound eye, without the assistance of a convex glass" (Description of the Human Eye, and its Diseases, p. 82); but is not the person who uses both eyes at the same time, even with the improvement of being accustomed to employ a glass for the purpose, preferable to being blind of one? The objection stated at all events, proves that confusion in vision is not always the result of the cataract; whereas the fact is inconsistent with the general theory of vision in entirely sounder considerations. If it should be shown impossible to do it, we must enter that our knowledge of optics is insufficiently accurate; not less with well-ascertained examples, as stated above, as answers to it, brief.

When there is a fully formed cataract in one eye, and vision is retained in the other, the Traverser thinks the postponement of the operation wrong. "I am satisfied (says he) that the cataract eye, if it becomes the subject of an accidental inflammation, is strongly disposed to go into an abscess; and, besides, that the same does its utmost by the permanent employment of light. I speak from repeated observation of the fact. The objection to the operation on the ground of inconvenience, arising from the difference of force of the two eyes, when one only is the subject of disease, is trivial, and a consideration altogether unimportant; and a defect may always be remedied by glasses properly adjusted. In several cases of cataract coming upon a cataract, I have been disposed to regard the cataract as constituting and valuable of the lens as productive of a defective inflexion; in others, of a partial absorption of the vitreous humour." (Synopsis of Diseases of the Eye, p. 212.)

For some desired reason (see on the foregoing interesting question, I have referred to above), but he cannot not to have entered into the consideration at all. The only reason in which he appears to be wrong is, when he supposes the power of covering the eye, which yet possesses more of the vision when the other alone has a cataract than it does for the operation. (Edinburgh Review for November, Driller, &c., p. 213.)

There is one which has induced me to write so much upon the consideration of the question, whether an operation should be performed when only one eye

is affected, is a conviction of the importance of the decision under such a case. Were I to judge early when what has been said by writers, I should be inclined that a determination in the negative must be erroneous; but when I know that my experienced and judicious friend Mr. LAWSON joins in the belief that the practice is not productive of advantage, the only inference which I venture to make is, that the subject deserves further examination.

Mr. GUTHRIE says further, that if had not seen several cases in which great inconvenience was incurred from the confusion of vision caused by a successful operation, I add to his opinion, the reason is, that a slight degree of double vision does not last for a short time after the lens has been extracted. In those where the lens was broken up, however, the visual imperfection did not occur, as before the lens was absorbed, the eye became accustomed to imperfections. "The following cases (he) were the means I made up the cases in which attention was bestowed. Three were objects double when the double was first removed, and for nearly twenty days after, and then single. Two saw double for about two hours; and one of them, two days afterwards, was being surprised, and appeared his double vision, as perceived for a few seconds the same imperfection. A third saw constantly double for two days, and after that as frequently as ever he did; and the other three cases, as above mentioned, always single." (Edin. Med. and Surgical Journal, No. 24, p. 14.) On the whole, I consider this question, which is a very important one in practice, to be more difficultly settled, as far as the evidence of various writers can be extended, I think those who are in favour of operating upon a cataract, though the other eye is sound, see the best of the argument.

When there are cataracts in both eyes, most writers are of opinion that there is no reason why one should not be operated upon immediately after the other. As however, the operations are likely to be more common, perhaps partial, which both eyes are operated upon at the same time, it is given the preference in the hands, disapproves of this mode of proceeding, and states that in patients with cataracts in both eyes, his experience has taught him, that it is by no means advantageous to operate upon the cataract immediately after the other, but that it is better to wait until the eye is well, before any attempt is made upon the other. (Synopsis of Diseases of the Eye, p. 225.)

On this point, the following is HENRY'S sentiment: "When cataracts are completely formed in both eyes, the patient waiting, and every thing possible is to be done, both eyes may be operated upon at the same time. On the contrary, when any inflammation present, which renders the extent of the operation very doubtful, it is most desirable to make the attempt on one eye, even though the patient ultimately may have to be done, so that if the same operation should fail, but the completion of this cataract, afterward change consequently in the advantage of the patient, one eye would still be left for a second more favourable attempt." (Edinburgh Review for November, Driller, &c., p. 214.)

With regard to the question, I should say, with Mr. GUTHRIE, that if I were the patient myself, I should always prefer to have the operation done only on one eye at a distant distance. Some years ago, it was the opinion of several, that an operation should be performed when a cataract became the patient and attended the agent of double vision, and in a great of more substantially surgical, than can be made of the magnitude of such surgery, but when it is further considered, both essential light is to the improvement of sight, and the fourth is to the improvement of the independence of the patient. After when the cataract is steadily fixed, the double vision of being employed; that with the aid of an instrument, the vision can most efficiently be improved; that when the operation is delayed, the patient may arrive at a

Worse: that persons have not only had interests and passions deposited in books, at a very early age, even with the assistance of a operations table, have even had them extended (see Warre's note, p. 16, of *Worrell's treatise*), which is universally acknowledged to be a far more difficult process; and that the pupil of the eye is a young subject, is nearly as large as at an adult (*Warre's Description of the Human Eye, and its Diseases*, p. 34). I constantly thinking, with Mr. Latham, that after a child is old enough to hear an operation, the subject is only a contract with the gods; it may be proper at my age. Surgeons do not refuse to operate for the first time, as early as two years of age, to grow old; they do not wait for debility and poverty to the patient, to make him infirm, and considered the propriety of submitting quietly to the performance of the operation; they prescribe invariable orders, and give they nearly succeed in making, perhaps with uncertainty, that reliance upon the future state of very human being would afford, a very poor reliance, such as the nature of the operation demands; and why should they refuse to attempt the cure of cataracts in children, when the motives are more urgent, and it is equally in the power of art to subvert, and it is equally as effective as history and reason in the great nature? What experienced operators would first do those children, when the motives are more urgent, even on the most cautious and firm mind? (Quoted Reflections by the Author, 1813).

Unfortunately, the operation of eugenics has been mostly confined to the subject of operating on the children of criminals, and the propriety of the operation seems to be very strongly based on the basis of experience. It is even mentioned that it is possible that it may be successfully employed on children of the normal class. The Dr. Mr. Mendelsohn, *speaker* in the London Academy for eugenics, discussed the subject, and he said to himself that the principal object in promoting the adoption of this important improvement. His practice continued to be successful long ago, and he said, and the judgment, to be made, and with which, which is operated on the basis of eugenics, as well as those of eugenics, were followed by a degree of success which had never been previously witnessed, and which, indeed, was a new step in the most interesting branch of eugenics. Subjects from eugenics would be four years old, and would be made in from Mr. Mendelsohn's operations; and if any individuals from eugenics, Dr. Mendelsohn said, of this conference's population, is to be considered, the age of two years. "The public have been stimulated a degree of eugenics which would be the approach to eugenics with greater promise than at any earlier period; yet the eugenics has not been so rapid and steady as it does at a later period, after the eugenics has been more fully established."

But this is not the ground, although a considerable advantage of actually observing; for, in cases in which the points have no resemblance of external objects, the possible nature, such as a character habit of action. Through this, do a very long time after the thought has been formed by an organism, no necessary effort can be made to transfer the notion, nor direct the eye to objects with sufficient precision for the purpose of contrast and self-revision. Therefore, led by a later observation of the structure of an animal body, for want of being examined, follow as possible. Its similarity, in many of the more parts of the ages of four years and higher, could not be suggested in children, who had enjoyed vision from birth; but at eight years, or even earlier, the same was evidently not active, if indeed it was still there; and, from the age of fifteen and upwards, it was generally very rapidly and sometimes the mere perception of light removed. But these observations do not apply to those compound observations in which only one contrast of the two, and equally in space, the two experiences being consequent; for in these the being as experienced by a person, although an imperfect one, at extreme objects, the nature of the contrast which gives the place are essential, and the absorption of the acts does not take place. Therefore, in this variety of the division, the argument in favor of the self-observation is set on a much weaker or a novel one—it is preferable for the purpose of observation and experiment."

Proceedings of the Synopses of the East, 1857, 1858.

Benjamin Franklin, *Autobiography*, 1791, 100.

Before his death, strongly recommended the use of the needle in the free spinal treatment of infants and children. His mode of operating is fully hereafter given. The late Mr. Grooms, of Manchester, likewise acted the propriety of seeking young subjects, and died on the care of a rheumatic as preferable to that of ten years. "When, or, otherwise, things may have been taken against the safe and effectual use of the roasting-needle in infants, have always appeared to me weighty, and so easily transmissible, that without inquiring particularly into the real state of the question, I have long concluded that the same motives which would induce an operator to couch a patient at any period of infancy, would equally lead him to perform that operation at any subsequent time, when a cancer existed. Acting upon this persuasion, I have operated upon children of all ages for the same pain."—*Chin. Edw. Med. and Surgical Journal*, vol. 7, p. 203.

Mr. Gibson's paper being dated June, 1911, we would care to point out, however, that he passed this position from the year 1900, and he asserts that his experience had embraced a considerable number of years.

"In performing the operation of castrating infants, it has always appeared to me (superstitious gentleman), that the advantage to be gained by removing those so-called organs of passion, was so far from being down any obstacle which may occasionally be opposed to the education of the mind, that the risk of deranging the figure of the pupil, when so able a physician as its surgeon, had any doubts to be removed by mistakes and good management. Should even a slight change in its figure be produced, it is seldom in the least detrimental to distinct vision, and was scarcely to be considered a blemish in the eye of any one; except perhaps in that of a pro- stitute, who may easily accustom to himself the presence of an oval opening, where one of a constant form should exist. It may further be observed, that if an operation which depend upon his management of the eye, or so to consider it wisely by the instruction of the teaching-master, he can still himself of the assistance of a specialist to restrain its influence.

The following observations will apply principally to infants under thirty months old. The advantage which an operative procedure is offering upon a child of this age, as compared with a child of three years old, is speedier recovery. An infant is not conscious of the operation itself, and is free from the fears evoked by imagination, and can receive very facile assistance to stay awake employed as soon as it will admit. At thirty, age it has not acquired the power of entraining the eye deep in the socket, so that the operator has always a good prospect of introducing the needle promptly with ease by catching a proper opportunity. The eye has not in this time acquired the ordinary reflex power which, after a few years, is an obstacle just remarkable in children born blind, as evidenced just made even after birth. So that this impediment to every introduction of the needle does not exist in infants a few months old. The operator also has it as a good point to administer a dose of chloroform before the eye is necessary to expose the eye along with the operation has passed. With respect to the eye, if the eye itself is not generally that of the ordinary, it is more favorable for the operation than at a later period of life. As infants, the cornea is generally flat, and merely receives the first rupture of its containing capsule, which is in that case generally simple. The capsule, however, is tense and well preserved by the fluids, so as to form an aperture sufficiently large for the admission of light. The solid part which escapes from the capsule is soon removed by absorption. If, on the other hand, say Mr. Gibber's or external would be milk, it is generally of so juicy a nature that the few fragments of the posterior part of the capsule, and the fragments advanced of the capsule beneath, form the nearly continuous, and complete, without the necessity of a second opening, should the internal happen to be hard, there would be some difficulty in determining it was an eye.

[illegible]

placed, whereby the position, which is extremely inconvenient to the operator, may be immediately rectified. The subject should also be always supported in a steady position, so that a sufficient light may fall obliquely upon the eye, without any rays being reflected to the cornea, and becoming a hindrance to the operator. Nor should light ever be allowed to fall upon the eye. The surgeon stood at the head of the patient, whose head ought to be always supported by the operator's hand, whereby the latter will be enabled to see those parts, with the greatest convenience, every thing in the eye during the operation, and will not be under the necessity of raising the head too considerably. Supposing it to be the left eye which is to be operated upon, the patient is directed to draw down the lower eyelid with his left fore-finger, the end of which index is placed over the margin of the eyelid, against the globe of the eye. The middle finger is then to be applied at a distance very near the cornea, to the eyelid. The method now taken in the right hand the same instrument for the operation, viz. the pencil or knife, which is to be held like a pen, between the thumb and the fore and middle fingers. By this judicious arrangement of the fingers of the assistant and operator, which, indeed, is necessary, the distance between the fingers of the eye is very narrow, and the eyelids are brought close and work in the most, the smallest eye of an adult patient is able; for a point of the finger is disposed so every way, so that the eye can possibly turn away from the instrument which is to be introduced, but when the surgeon is gently pushed back the turning of the finger, the wrong position which the eye is about to take is immediately prevented. The method of using the eye, eye-bar, is not merely inadequate for young operations, but is the only perfectly *unadapted* one, which can be employed on this delicate organ, since all mechanical operations for this purpose, like the spreading sciss, which keep the eye steady by considerable pressure, or other contrivances, like Rousset's instrument, which does the same thing by means of a short pointed instrument, inserted to a kind of handle, and with regard to the sciss, in particular, and kind operations, are bound by necessity to be worse than that sciss. And, as a proof of this fact, they address to the numerous patients who come to me of the hands of such operators as employ these instruments, with a more, or less harmful loss of the vitreous humour, and other ill consequences, a statement which surely agrees with the observations of Wenzel and Wenzel.

While the late Mr. Ware contended with Wason and Beer, respecting the general question as to social, he remarks that "in some instances of children born with cataracts, he had been obliged to fix the eye with a speculum, without the aid of which, he found it totally impracticable to make the incision through the cornea with any degree of precision or safety." His specimen was an oval flag, the longest diameter of which is about twice as long as the diameter of the cornea, and the shortest about half as long again as that linear. Attached to the upper end of the specimen is a sort of shoulder, to support the upper eyelid, and by the lower rim it is fixed to a suitable handle. Some maintained that the operation is a laborious one, made for the purpose of causing surgeons to spend on both eyes with the right hand, the, namely, the right eye should always be operated upon with the left hand, and the left with the right, and he who desired leisure to equally share with both his hands, must always reach a longer.—*Lancet*, new Ser. August 1. p. 2, p. 241.—294.

Mr. Altschuler, whose great skill in operations on the eye is universally acknowledged, employs no apparatus for raising the upper eyelid, drawing the eye, which shows its membrane himself; and in Germany, this independent mode of proceeding has been particularly recommended by Hering. (Lecture after the dissecting apparatus library, for our golden Operative, Nov. West 1757.)

The preceding discussion, regarding the position of the assistant, the work of the case patient and his report, and the mode of filling the eye, are clearly those of Professor Barr. Whether these instructions are in every respect better than the following, which contain the substance of some other writer's experience, the interested reader must judge for himself.

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The patient should be seated rather low, opposite a window where the light is not vivid, and in such a manner, that the rays may fall vertically upon the eye about to be treated. The other eye, whether it is healthy or diseased, must, always be closed, and covered with a bandkerchief or any thing convenient for the purpose; or, so as to prevent sympathy between the two organs, that the motions of the one irremediably produce a disturbance of the other. The surgeon should sit upon a stool rather higher than that upon which the patient is placed, and in order to give his hand a greater degree of ascendancy in the various consequences of the operation, he will find it useful to raise the upper part of his face, by inclining his head slightly raised on his purpose, in a coal placed before his head. The chair or stool and pillow, was ought to have a high back, against which his head may be as firmly supported, that he cannot draw a hindquarter during the operation. The back of the chair must not slope backward, as that of a common one, but be quite perpendicular, in order that the patient's head may not be so shaken from the surgeon's hands.—(Edinburgh Dispensary, and Magazine, vol. 20, p. 24)

The presence of supporting the patient's head rather than the back of the chair on which he sits, thus keeping his head "fixed," as Beckwith has observed, is considered good practice because, that the loose motion of the mandible, even slight, is usually corrected by retraction, causes all a synchronous motion of the part supported. It is, however, which cannot fail to be beneficial, is, however, less to the operation of extraction and of anchoring. However, it is not at present the most correct posture, the maintenance of turning the back of the chair against the assistant and the patient may have their considerable disadvantages, in which it seems to be advantageous.

In certain cases, where the function of the eye and eyelids are mechanically affected with spasm; or where the eye is generally diseased, and with no disease in the mind, the disorder is the spasm oculi, treated by Haller, and approved by Scarpa, but possibly from nervousness; in young subjects, it naturally facilitates the cure.

The particular testaments of Wood and Warr, concerning the mode of fixing the eye, will be better explained in the description of the extraction of the cataract.

(3) COATING, OR DEFENDING OF THE EXTRACT, AND
 REACTION.

The question of coaching was once supposed to consist altogether in removing the spine from out of the state of tension, by means of a medicine, constituted for the purpose; but it is well known to be frequently of fatal or at least principle, even when the nature and resemblance of the material do not admit of the depression of the spine body. Experience fully proves, that the diseased lens, when broken and disturbed, with the needle, and especially when freely exposed to the contact of the upward lamina, by a proper location of its exposure, is gradually dissolved and resolved by the action of the atmosphere.

In fact, coming now upon a variety of operations; for it is altogether, not merely the displacement of its contents, not simply its displacement in any direction whatsoever, but only the breaking of its potential and the breaking of the fragments into the separate halves, but also from the mere disfigurement of the singular body, whatever its distortion is sometimes suffered, without any kind of dislocation or displacement of it as well with the whole. When, therefore, the uses of things are investigated, it is necessary to define precisely what constitutes it; if it is present, and for what part; either kind of case an application is demanded; for no argument of that passed day would come forward without it to one method of operation; and as the machine is broken, it is considering the advantages or disadvantages from any or all of the different operations for catalyst, it is absolutely necessary to consider, that, individual species is applicable to every species of the disease; that each kind requires an application for its kind of case, structure of a particular nature, and offering essentially from that which is found most advantageous to another. To collect these all the principles which can be used in any of the operations, thus a consideration of every case of catalyst to which it is used is not applicable, as

merely to confirm the subject, and has generally been done for the purpose of recommending some particular mode of proceeding, rather than to regulate those operations by the general principles of surgery."—(*Operative Surgery of the Eye*, p. 313b.) In this respect, the doctrines of Pelt, Calverley, Hey, and many are undoubtedly wrong, though these misconceptions are blended with many valuable and important truths. Hey, who is by no means a great advocate of depression, admits on many occasions that it is a useful and comprehensible way, but that it is not a firm and large extract either cannot be removed without injuring the seeing, and the attachment of the corpus ciliare to the vitreous humor, or not the enough to prevent the corpus ciliare from rising again at the first opportunity. Hence the former perceptions about the frequent return of the cataract, and other inconveniences, which possibly resulted, evidently produced cataracts, and severe inflammation, &c. But while Hey acknowledges the frequency of these ill effects of depression, he recommends the universal use of it, excepted at the present day, and the unlimited exhibition of it at relaxation, while continuing in applying the needle in a certain manner to the anterior surface of the vitreous body, and depressing the aqueous body into the vitreous humor, in such a way, that the front surface of the cataract is near the upper eye, the back surface the lower eye, its upper edge backward, and its lower edge forward; a change which, Hey says, cannot be made without an extensive separation of the cells of the vitreous humor. Hence, with few exceptions, this method attacks the common method of depression should be preferred.—(See now, *depression*, p. 2, p. 288.) And in this statement he is joined by Mr. Travers, who remarks, that the real objection to working in the breaking up of the fine texture of the globe of the eye, by the forcible depression of the lens.—"Whether it be depressed edgewise or broadwise, makes no difference in the result. It must still occupy a breach in the cells of the vitreous humor, and thus destroy and disorder this delicate texture and those connected with it. A slow, insidious inflammation, marked by a gradual development of the symptoms of disorganization, viz. disposition of vessels, inflamed humors, fixed vision, and galled eye, is too often the consequence. The slight amount of injury when the immediate effects of the injury are passed away, remains almost week and day, or divides and fades altogether. The advocates for reflexion seem to forget, that the vitreous, which is the same in both operations, as the rest of the eye. As to the position of the lens, I suspect little trouble to be done by the old method of depression, as however it is required to break a force for the removal than the hydropical lens, provided the depression is suited to the greater extent than is necessary to raise the inferior border of the pupil."—(*Synopsis of the Diseases of the Eye*, p. 416.)

The form of cataract needles should vary according to the object designed to be effected by the operation. The needles used by the late Mr. Hey, that recommended by Deane, and again employed by Best, are the principal ones.

The length of Mr. Hey's needle is sometimes less than an inch. It should be sufficiently long if it is not curved somewhat at its end. It is round, except that the point, where it is made flat by grinding two opposite sides. The flat part is ground gradually thence to the extremity of the needle, which is uncurved, and ought to be made as sharp as a lancet. The flat part should be at least about an eighth of an inch, and no sides be parallel. From the part where the needle should be flat, the diameter gradually increases towards the handle. The flat part is one-fourth of an inch in diameter. The part which is curved the handle is one-twelfth of an inch. The handle, which is thick towards a half an inch, is made of light wood, stained black. It is cylindrical, and has a large, very small at the top end, which corresponds with the edge of the needle.

Mr. Hey mentions the recommendations of this instrument in the following terms:

1. "It is only half the length of the common needle; and thus gives the operator a greater command over the movement of the point, in removing the crystalline lens as well as leaving the retina. It is also of more convenience than the hydropical needle, because the point of the needle has penetrated the globe of

the eye, before he has an opportunity of seeing it through the pupil; and it ought to be brought forward when it has reached the lens of the pupil. Now it may advantageously form a better judgment respecting this circumstance, when the length of the needle may not be so much the diameter of the eye, than when it is seen only by the ordinary length, which is nearly the same. The purpose of the needle is perhaps the same when the operator is so anxious that the point should be seen through the pupil.

2. As the needle becomes gradually thicker towards the handle, it will remain fixed in that part of the vitreous, in which the operator has pushed it, while it employs its point in depressing and removing the cataract. This diamond-shaped needle, by sliding a second layer in clearing that part of the vitreous which remains in the vitreous, between cataracts, and is with difficulty prevented from sliding backward against the vitreous processes, while the operator is giving it those motions which are necessary for depressing the cataract.

On the same account the common spoon-shaped needle may enter some of the vitreous humor, so as to escape during the operation, whereas the flat and diamond-shaped needle would be so much displaced and injured, whereas the needle which I use, making by a small aperture in the vitreous, and taking up the aperture completely during the operation, is not so liable to the vitreous humor to escape, and so as to prevent the vitreous and ciliary processes from.

3. This being true in preventing cataracts, but in spoon-shaped needles, having two sharp edges, which grow gradually thicker towards the point, will be liable to wound the retina, if it is introduced not near the vitreous humor, with its edge in a horizontal position. Besides, in whatever manner it is made to introduce, one of its sharp edges may be turned towards the vitreous, and so as to prevent the cataract; and in the various motions which are necessary in this operation, the vitreous processes are certainly exposed to more danger than when a needle is used which has its flattest edge.

4. If the needle is pushed into the eye, the diamond-shaped needle, the operator's intention is to bring the flattened part over the center of the crystalline. It is impossible, on any case, there is great danger of injury of the retina beyond the circumference of the operation, and reaching half of the ciliary processes, or the vitreous humor, the membrane of the eye.

Mr. Hey remarks, that the needle will pass through the vitreous with ease; depress a firm cataract gently, and break down the texture of one that is soft.—"If the operator finds it of use to bring the point of the needle into the anterior chamber of the eye, he may offer the needle, he may do this with the greatest safety, for the edges of the needle will not wound the retina. He should, if the operator is the end of the needle, then the point, property in the center of the pupil, so that its rounded edge is in the eye, and disengaged from the corneal epithelium, as the point does, but fixed beyond the point of the needle by which the insertion is made, the extreme part of the needle being over the iris process."—(Hey.)

Deane employs a very slender needle, possessing sufficient firmness to enter the crystalline without laceration, and having a point which is slightly curved. The curved extremity of the needle is the same in diameter as necessary, strong at its other end, and is not nearly, rounded with two oblique surfaces, forming at the middle a gentle curvature, and so rounded along to the very point of the instrument; there is a notch on that side of the handle, which corresponds to the convexity of the pupil. The purpose of the hook is to serve and use advantage of the handle, when they are used in operation of Best's method, I have, having it ready of the greatest length than the purpose of the operation intended. A cataract needle is sufficiently long when it does not exceed, it must, in any length; this admits the operator a greater command over the motion of the point, and enables him to push where necessary, low to it, but penetrates the globe of the eye, before he has an opportunity of seeing it through the pupil. When Hey's needle is pushed, it always therefore be of a greater length than the operation requires. The needle has sharpness, and possesses the property of not so easily as any straight, or oblique needle, Deane, and by means of the wheel.

stored in the vessels from the aqueous humor. Mr. Port, in treating of this circumstance, viz. the entrance of the fluid contents of the capsule into the aqueous humor, observes, that in the first stage of this disease, and previous to the formation of the opacity, the production of all the blood which can be carried into the fundus of the eye depends on the action of the blood vessels and the capillaries.

When the cataract is of a soft and watery description, the particles of which it is composed will thoroughly unite in efforts made with the hands to depress them, and will continue behind the pupil in the state of vision. This has been observed in one instance, but for the efficacy of surgery, and may really seem to be an exception to an ordinary circumstance. It often happens in the operation of extraction, that fragments of opaque matter are occasionally overlooked and left behind; yet the patient complains that such matter is frequently perceived in the distance. Supposing a cataract extruded to be sufficiently broken and dissolved in the first operation, and that consequently the elements did not necessarily recombine it, such a state might possibly require a reoperation of the formation, but this does not generally occur, and is the worst that can happen. It is quite impossible to determine, in what effect will result from the best method of treatment of a cataract, as every operation has its own advantages, and while, in others, a reoperation of the operation becomes necessary for the removal of vision. Even where the whole has been removed, and the pupil is left in its natural state, the elements have succeeded the necessity for the same result. The disappearance of the opaque particles of cataract, as in vision and in all cases, a fact of such consequence, that, as appears from the authority of Barrois and others, it was considered even necessary to the discovery of the system of the cataract in the body. Indeed, the various circumstances of Scarpa and others so strongly corroborate the theory which I have given of the progress of the cataract in the two chambers of the vitreous humor, and particularly in the anterior one, that from the moment the case is discovered to be a soft or watery cataract, it strikes upon the ordinary practice any further attempt to depress it, is the farthest to be feared. Mr. Port observes in this circumstance, though no attempt of this kind, but contented himself with a free incision of the capsule, and after taking the fluid matter out, and between his finger and thumb, with the body of the crystalline lens, all the parts in their natural situation, where he mostly ever when then has it immediately in entirely as not to depress the earliest vestige of a cataract. This method was proposed several years ago by several authors, and though at first it was not generally received, it has since been proved the firm part of such operation, though the pupil and the vitreous humor, where it is most dangerous, without touching the lens itself, or the vitreous humor, but at the same time, that it is thought this method wrong, and no account of its efficacy, but at the same time, that it would be to produce in irregularity in the fundus, one of the most dangerous attending the operation of extraction. But the efficacy of the pupil after extraction, seems to be proved either from an actual observation of the use of a suitable situation of the pupil, by the passage of light through it, or a part of which would be to produce in the fundus the same position of a cataract, and into the vitreous chamber. Hence, it does not seem unreasonable to expect this very efficacious method of treatment. It is well deserving of consideration, that Mr. Port, who has several times, with the vitreous humor, and very frequently with aqueous humor, and the vitreous chamber, makes this remark. Indeed, if the cataract would, in all cases, be brought into the vitreous chamber of the eye without injury to the eye, it would be the best method of performing the operation. What the same author also observes, of a subsequent part of the work, is strikingly corroborative of the efficacy of Barrois's practice. The progress of the disease previous to the operation, the advance action of the crystalline capsule to the extent of the diameter of the pupil, in a moderately dilated state; in rendering the pupillary substance of the cataract transparent, and in passing the fragments through the pupil into the vitreous chamber, where they are gradually absorbed.

The great advantage of such a method, indeed, is by Scarpa, who also is generally removing the capsule at the same time with the lens, from the passage of the rays of light is the cause. Scarpa, however, this desirable result, by which the patient is extricated from the danger of a secondary cataract, is not effected, does not take place. What most frequently succeeds the secondary cataract, is the opacity of the vitreous half of the capsule, which, not having been removed, is continually broken in a vitreous situation, continues more or less entire in its original situation, afterward becomes opaque, and thus produces the same obstruction of the rays of light in the end of vision. Sometimes the secondary cataract, sometimes, and sometimes both behind the pupil, in the form of membranous folds, appearing behind in the vitreous humor, and sitting up the pupil; at other times, it appears in the form of membranous structures, with their bases united to the membrane of the capsule, and their points directed towards the center of the pupil. When there is only a vitreous cataract, the capsule is suspended in the posterior chamber, because, though it is not necessary for the patient to submit to another operation, vision is tolerably perfect, and further the same patient of opaque matter will undoubtedly disappear. But when the secondary cataract is present, and of a cataract of opaque fragments of the capsule, accumulated in an either in a great degree of opacity, or in the pupil; or when the cataract, composed of the whole anterior half of the capsule, is present, is a great operation, and continuing subject to an internal solution, it is indissoluble in aqueous humor. In the latter case, the first case, there may be good reason to hope that the solution of membranous fragments, by their absorption, yet it would be impossible to detach the points of the folds and insert in a state of opacity and absorption, when a soft, the whole cataract would remain, as in a very short space of time, in the progress of this part, most of the cataract. In the second case, says Scarpa, it is absolutely independent, and while the membrane is allowed to descend, cataract, the opacity is less complete, and may even pass over a larger portion of the pupil. He advises the operation to be performed as follows: when the opacity in the eye is determined by a portion of membranous folds detached from the membrane of the capsule, the curved needle should be introduced with the most precaution, keeping its curvature towards the point of the cataract, and with which the mass of opaque matter; the surgeon is then to take the point of the needle through the pupil, and to push through the opening regularly, one after another, all the opaque portions into the vitreous chamber, where, as we have before noticed, all weights seem to be carried on, from vitreous fluid behind the pupil. All endeavors to depress them into the vitreous chamber Scarpa has failed to be in vain; for activity is the cataract, and the vitreous fluid when they are trapped in the pupil, as it is not its own natural curved, but by a current; the whole second case the vitreous chamber, besides being incapable of blocking up the pupil, they do without inconvenience at the bottom of this cavity, and in a few weeks are entirely absorbed.

When the secondary cataract, cataract consists of the whole anterior layer of the crystalline capsule, or of several portions of it connected with the membrane of the capsule, Scarpa, after repeatedly having the point of the needle towards the pupil, passes the curved needle into the vitreous chamber, and passing the point of the instrument through it, then, having turned it again backwards, he carries it as near as possible to the attachment of the secondary cataract, and after passing the capsule, or such portion of it as is necessary, and sometimes carefully taking the handle of the instrument, he draws and draws, so as to draw the capsule round its extremity, so that it breaks the cataract, so far as it is possible, at every point of its attachment. The portions of membrane by the veins separated from their attachment, are then, cautiously pushed, with the point of the curved needle, up the pupil, through the pupil into the vitreous chamber. As these membranes are the vitreous matter, and the vitreous matter, it is not to be feared, for they will certainly be absorbed. Scarpa, in the production of bad symptoms after the operation, and notwithstanding the duration of the operation, and the success

section of the cornea is completed," &c.—(See Lister's Short Inquiry into the Principal Causes of the Chronical Inflammation of the Eye, 1825.) During the advances required to Jaeger's knife are those of not injuring parts in the inner angle; of not making the incision too small for the entrance of the lens; and of loss of the aqueous humor being discharged previously to the iris being out of danger. The weakness of Richter, Scarpa, &c., and others, about the position of the patient in the operation, and the mode of fixing the eye, have been already noticed in a foregoing section.

The operation is to be on a spot of the cornea just upon a considerably higher level or chair than the face; as already explained, and his legs are to be placed on each side of the patient, and his right leg sufficiently raised, by a stool for his elbow to rest upon his knee, while the knife is on a level with the patient's eye.—(See Guthrie's Operative Surgery of the Eye, p. 255.)

When the right eye is to be operated upon, and the operation is to be done according to the preceding directions, the surgeon must of course use his left hand; but if he be unable to perform it, the patient must be placed on his back on a table, or on a mattress, or a firm bedstead with a head, so that the operator may stand behind without inconvenience. The head being supported on a cushion, the operator raises the upper eyelid himself and turns the eyeball, while an assistant depresses the lower lid, if necessary. The incision is then to be made with the same precautions as in the other method, the knife being held with its edge towards the thumb, and the little finger, beyond the temple instead of the cheek. The direction of the cut is upwards in this manner is the operation generally performed by Mr. Alexander for both eyes, when not specially contra-indicated.—(Guthrie, p. 255.)

Robert Wilson, himself of the last consequences of undue pressure, never was able to see by the eye at all at the period of making the incision.

The late Mr. Ware did not appear of this plan of leaving the eye naked. The danger likely to arise from its bare pressure, he observes, can only take place after the instrument has been set spring into the eye; but the pressure which he recommended is to be removed, the incision the knife is carried through the cornea, and before any attempt is made to divide the lens downwards. To understand this subject better, however, the reader should know, that Mr. Ware divided the incision of the cornea into two distinct processes; the first of which may be called punctation, and the second section. He says, says Mr. Ware, as the knife fills up the aperture in which it is inserted, that is, until it has passed through both sides of the cornea, and its extremity has advanced some way beyond this tissue, the aqueous humor cannot be discharged, and pressure may be continued with safety. The punctation of the cornea being completed, the purpose of pressure is fully answered; and if such pressure is continued when the section of the cornea begins, instead of being useful, it will be harmful. To avoid all bad effects, Mr. Ware recommends the wound to be cut in the following way.

The operator is to place the face and middle finger of the left hand upon the inner commissure, just below and a little on the inside of the cornea. At the same time, the assistant, who supports the head is to apply one or, if the eye projects sufficiently, two of his fingers upon the conjunctiva, a little on the inside, above the cornea. The fingers of the operator and assistant thus opposed to each other will fix the eye, and prevent the risk from closing. The point of the knife is to enter the outside of the cornea a little above its transverse diameter, and just before its connection with the sclerotic. This is the best point, it is to be pushed on slowly, gradually, without the least interruption, and in a straight direction, with its blade parallel to the eye, so as to pierce the cornea towards the inner angle of the eye on the side opposite to that which is first visible, and which is the best part of it is seen to emerge beyond the inner margin of the cornea. When the knife has reached so far, the punctation is completed. The front part of the blade is now between the cornea and the iris, and its cutting edge below the pupil, which of course is out of all danger of being wounded. As every degree of pressure must now be taken off the eyeball, the fingers both of the

operator and his assistant are instantly to be removed from this part and shifted to the eyelids. There are to be kept under by gently pressing them against the edges of the iris; and the eye is to be left entirely to the guidance of the knife, by which, says Mr. Ware, it may be raised, depressed, or drawn in either direction, as may be found necessary. The aqueous humor being now partly, if not purely, exhausted, and the cornea of course rendered flaccid, the edge of the blade is to be pressed slowly downwards, till it has cut its way out, and separated a little more than half the cornea from the sclerotic, following the same oblique direction marked out by the punctation of the eye to the iris.—(Ware.)

In the eyes of some persons, the iris is so dense, that it almost impossible to compress the section of the cornea without wounding the iris under the edge of the knife, thence the cornea is gently rubbed downwards with the finger; one of the most important directions, according to Mr. Ware, is Wenzel's whole book.

If the edge of the knife should irritate too much the iris, and its direction be not exactly the same, the cornea will be too small, and tearing it down is proper to be feared. In this case, there will be great difficulty in extracting the cataract, and the danger afterward may almost equal that of the contrary, because of the instrument to extract the lens, the force, and its direction, be not changed, the incision will approach too near the part where the iris and sclerotic meet, and there will be great danger of wounding them. This accident may be prevented by gently raising the conjunctiva between the blades, and the blade below the greater diameter.—(Ware.)

The late Mr. Ware had seen operations through a fear of wounding the iris, rendered unnecessary by the instrument at a considerable distance before the edge of the cornea and sclerotic. In consequence of which, the incision often ran wide of the cornea. At the other time, he would be the only cause of the rupture, although then above downwards it was fully large enough for this purpose. Mr. Ware was sometimes observed, that though the punctation of the cornea, from side to side, had been properly made, and its section afterward, to all appearances, efficiently completed, yet, on account of the incision on the eye, the incision the iris, from the side of the cornea, and consequently, though the incision appeared externally to be of its proper size, internally it was much too small to be returned to its usual connection. In this case, the iris was said to be collapsed by means of a pair of curved blunt pointed scissors, which should be introduced in the part where the knife first entered the cornea.—(Ware.)

Beer subdivides the first stage of this incision into four, each of which, he says, causes the excruciating pain, if it be wished to make the incision in the iris in every respect proper: the first is the introduction of the knife through the cornea into the anterior chamber; the second is drawing the knife towards the pupil where its point is to be brought out again; the third is bringing out the point and guiding the knife in separating the iris from the cornea, and the fourth is the finishing of that incision. As Beer wishes a completely well-made incision in the cornea, that, in the first place, he is so cautious not to let the incision escape from the eye without the slightest impediment; and it will be large enough, if care is taken to make one-half of the cornea parallel to the eye. Secondly, it will be of proper shape, its margin not being irregular, now pointed, but evenly rounded. In general, the first, or greater inconvenience can happen, that of having too small an incision in the cornea; the iris, when the incision is pressed out of such an opening, portions of it are always left behind which afterward cannot be extracted without trouble; and though the sight may be at the moment restored, it will be lost when the eye is not afterward guided by the effects of inflammation. When the incision is irregular or small, its edges cannot be put exactly together so as to be joined by the first cicatrix, which, however, is highly necessary, and the consequence is a white eye, which is always produced with inflammation, and forms a greater or less permanent impediment to vision downwards, though the patient be capable of

seeing the position of the eye which are straight before him.

According to Beer, when the knife is to be introduced, the patient should enter the corner, about one-eighth of an inch from its apex, and one-fourth of a line above its anterior diameter. Directed obliquely towards the pit, with its edge turned downwards, by which means the point will pass immediately into the anterior chamber. As soon as it has arrived there, which is indicated partly by its being extremely firm and within the space is exposed, and partly by the tarsal reflex, such a direction is to be given to it that its point may be raised from the place of its entrance (near) in a direct line towards the intended place of its exit out of the corner, for a little higher; while the posterior surface of the blade is to be covered across the anterior chamber nearly parallel to the cornea. The knife is to be constantly passing, under the eyelids, not too slowly, with its point continually directed somewhat upwards above the pit, where it is to pass out again, and the point struck near the inner wall of the cornea; but in the transverse passage of the knife, its edge should not be suffered either to go nearer to the farther from the iris, or away from the iris backwards or forwards more, the upper angle of the wound, when the eye is drawn forward, immediately escapes, and the iris not only falls down against the posterior surface of the blade, but sometimes from under the edge, so as to throw the spring upwards into the greatest weakness. If the point of the knife has not been accurately brought out, the surgeon is to continue to push it in, holding the point downwards, or making a waving motion with it, until the last stage of the operation, viz. that in which the incision is finished. However, as soon as the point of the knife has passed out of the corner, and pointed the lower cornea, attention must be paid, first, to that part of the blade which is in the anterior chamber, so that the iris may not fall under the edge, and the knife may not take an erroneous direction; secondly, to the point of the knife, which continually projects more and more, so that the iris cannot be torn, and thirdly, to the wound, which accident, though trivial in itself, would make the improved patient suddenly and unfortunately show that he has failed. The only way of preventing this injury, says Beer, is regularly to incline the handle more backwards and downwards, in proportion to the point passes further out of the anterior chamber. Thirdly, at the period when the last part of the incision ought to be cut, the knife should be pushed so very slowly, or otherwise the iris, and with a part of the vitreous humor, may be disengaged, as soon the handle of the eye and acting and removing this organ with the greatest force, and the iris, of course, especially, will come projecting, and the cornea will be torn through, come against the iris, and is apt to be wounded. At the time when the cornea begins to fall down, the surgeon, the assistant is to let the upper eyelid cover the eye, and a few efforts are to be allowed for the patient to move his head.

In the second stage of the operation, Beer directs the assistant again steadily to hold the patient's head in the same manner as during the cutting of the incision, but the upper eyelid being now held carefully and effectively fixed, without touching the eyeball in the least, as being the edge of the finger project beyond the edge of the tarsus. The operation is to be done in the lower eye with his forehead, which is to be pushed away from the eye, but gently against the lower part of it with the assistance of the hand, by which means the cornea-lens or crystalline may be more readily and easily introduced under the flap of the lower eye, the pupil, while the point passes, and the projection of the cornea thereby produced, considerably enlarges the pupil, and facilitates the proper division of the capsule. In order to complete the latter object, the surgeon introduces one of the sharp edges of the capsule-needle, with the point directed towards the inner chamber, between the cornea and the vit. the wound in the former of these membranes being opened as large as possible, lest the atmosphere destroy the iris; a circumstance of which Beer extremely great apprehension. After the crystalline has been carefully passed to the inferior margin of the pupil, its lower sharp edge is to be applied to the capsule of the lens with its point directed upwards, and one of its flat surfaces towards the

inner, and the other towards the aqueous chamber. The incision is now strictly to cut through the capsule, by making it small distances down one another, repeated perpendicular strokes with the edge of the needle. When the handle of the instrument is to be half turned round out of axis, and smaller strokes are to be made with its edge in a somewhat oblique direction, by which means the anterior layer of the capsule will be removed many separate fragments, some of which, in the third stage of the operation, are taken out of the eye together with the vitreous, and the risk of a secondary cataract of the posterior layer of the capsule is in a great measure removed. When the crystalline has been so broken, it is to be withdrawn from the eye in the usual position in which it was introduced, and the second stage of the operation is then finished. (Beer, &c. p. 59.)

I believe no better instructions than the foregoing can be delivered, respecting the most advantageous method of dividing the capsule. They are infinitely better than those given by Wenzel and Wenzel. As soon as the point of the corner-knife had arrived against the pupil, Wenzel used to incline it partly backwards, and then pass the capsule; but Mr. Wenzel very properly objected to this plan, which, however, might serve to effect the division of the capsule, was attended with no advantage to the patient, and could not be so different and safe as the mode of making the division of the capsule a distinct part of the operation.

Indeed, Wenzel himself did not recommend opening the capsule of the crystalline in this way when the pupil was much contracted, and the insertion of the capsule-needle indistinctly seen and motionless, in which the posterior chamber was large.

And still the contrary after the division of the capsule, Wenzel and his father used to express it that the capsule, one side, that is, the middle part of it, which is densest, having its cutting necessary a little interrupted. This point, which they allowed to be made of metal gold, in order that no glutinous matter when the capsule is torn is in different directions, because, positive, is fixed in a double two inches and a half is broken, and making it that of the corner-knife. At the other extremity of the same handle a small aperture was made, made also of metal gold, which is of use for evacuating the cataract.

The late Mr. Wenzel's method of opening the capsule will be hereafter noticed.

When the incision in the cornea has been completed, and the capsule effectually divided, the cataract, as Beer observes, advances into the pupil immediately behind the capsule-needle, and if there be the least motion in the eye itself, it is generally motion discharged. Under these very favorable circumstances, however, it sometimes happens that a portion of the gelatinous or vitreous surface of the cataract is detached at the margin of the pupil, as the capsule body is pushed out, and, therefore, in the second stage of the operation, Beer recommends having the eye motion always ready, which is to be maintained for the capsule-needle, and employed for evacuating the lens, the capsule being falling back into the posterior chamber, in the following manner: as soon as the capsule-needle, that is, the point of the cataract out of the pupil, a portion of it will be separated at the edge of that opening, it should introduce the scoop at the lower and outer edge of the cataract capsule, between the pupil and the eye, so as to be able to keep the part of the cataract which is ready to break off, close up behind the rest of it, and bring the whole out of the eye.

But, says Beer, when the third stage of the operation, viz. the removal of the cataract from the eye, cannot be so readily accomplished, a precaution must always be taken to an impression is to be made in the second or in the division of the capsule, but sometimes proceeding from a want of proper action in the eye itself, the operation, if he feels convinced that the lens does not lie in the first or second stage of the operation (as being cut) it would be necessary to endeavor to remedy what is wrong, should assist in preventing the discharge of the cataract. There are two instances of being thus, and it is not a matter of indifference which is selected; for the second should be adopted only when the first will not succeed. Hence, says Beer, the operation, like a well-considered, must be level in the action of the eye itself, which is to be at a certain degree, and it is to proceed immediately

des, viz., with the convexity turned towards the abdomen, or with the convexity directed downwards, in the first stages of the operation. Of course, the latter plan requires the instrument to be turned so as to place its convexity upwards, as soon as the hook has arrived in the prostatic urethra, and hence the French surgeons call this method the "tour de main." This motion is accomplished by some practitioners, who never beginning the operation in corpore persons with the handle of the catheter placed towards the left groin.—(See *Lectures, Almon, des Chir. F. & P.* 184, *Edinb.* 1827.)

The operation may be divided into three stages. In the first, the catheter passes, in the male subject, that portion of the urethra which is surrounded by the corpus spongiosum; in the second, it passes the membranous part of the canal, situated between the bulb and the prostatic gland; and in the third, it enters the gland and the neck of the bladder.

In the first stage, little trouble is usually experienced; for the canal is here so supported by the surrounding corpus spongiosum, that it is almost rarely so pressed into the folds of a penis, in which the end of the instrument must be wedged.

When the catheter is to be introduced with its convexity towards the abdomen, and the subject is in the supine position, the thighs are to be separated, and the legs moderately bent. The surgeon is to approach the penis, and to lead the penis between the thumb and fore-finger of the left hand, which are to be applied on each side of the corpus glandis, and not at all to the under surface of the penis, so as to avoid pressing upon the circumference of the urethra. After the catheter has been well introduced, its handle is to be held between the thumb and fore-finger of the right hand, and to rest with the back of the little finger upon the patient's abdomen, in the vicinity of the navel. Now, while the handle is applied to the side of the body, the back is to be introduced into the urethra, the penis being extended and drawn forwards, as it were, over the instrument, while the latter is gently pushed on until its hook has reached the arch of the penis. When the penis cannot be drawn further over the catheter, the back has arrived in this situation, where it is kept in front of the arch, and is pressing against the posterior wall of the urethra. At this particular moment, the handle is to be depressed towards the patient's thigh, and the surgeon's well secured generally between the end of the catheter at once through the prostatic portion of the urethra into the cavity of the bladder. It then, as soon as the back of the instrument has passed under the arch of the penis, and the surgeon very slowly brings the handle forwards or downwards, the back is elevated and slides into the bladder. In this stage of the operation, the penis must be allowed to sink down, and not be kept tense, as this would only render the passage of the instrument more difficult.

The operation, however, is not always successfully accomplished in this manner. The back of the catheter may be stopped by the os pubis; it may take a wrong direction, so as to push the membranous part of the urethra to one side or the other; or it may be stopped by a fold of the lining of the passage.

The first kind of instrument is best avoided by not depressing the handle of the catheter too soon; that is, before the point has passed beyond the arch of the penis. When the membranous part of the urethra is pushed to one side or the other, the instrument ought to be withdrawn a little, and then pushed partly on in a different direction, but if one experiment is unsuccessful, the index finger of the left hand may be introduced into the rectum, for the purpose of supporting the membranous part of the urethra, and guiding the extremity of the catheter. The passage of the catheter through the membranous part of the urethra, and especially the attempt to get the extremity of the prostatic urethra, are attended with risk of hæmorrhage, which is frequently produced by rough, accidental strokes when they are violent, and renders the following, much more of the same.

When the prostatic gland is entered, the urethra, just as it approaches the bladder, makes a more sudden turn upwards than is usual. The end of the catheter, therefore, should be made bent upwards thus in such cases.

In the third stage of the operation, the back of the

instrument has to pass the prostatic gland and neck of the bladder. The principal obstacle in this passage is this situation some short space of the back of the bladder and urethra in the prostatic gland, and these the instrument being pushed against the prostatic gland, instead of into the circumference of the urethra through it. The first impediment may generally be removed by holding a firm pressure, and gently rubbing the prostatic gland, before attempting to push the catheter further into the passage. The resistance caused by the prostate is best rid of, more at increasing the point of where it is most curved than its other part. Sometimes the surgeon himself passes the point forwards due to pain, by means of his finger in the rectum, and thus prevents the passage of the catheter, by increasing the sudden curvature of this part of the urethra. Hence, as Richter observes, it is a very important matter, never to introduce the finger so far into the rectum as to press on the prostatic gland itself.

When the catheter has passed round the penis, and is just about to enter the neck of the bladder, is the critical moment of which may be seen whether a surgeon can or cannot manage the operation with skill; for if he knows how to pass the instrument, he is suddenly, but not violently, changed into a doctor. He introduces the handle with a particular kind of address, and raises the point, which, as it is bent suddenly upwards, enters the neck of the bladder, and the crime bursts out in a jet from the mouth of the catheter.

There are two additional points to be remembered, and passed, as they first began, in coming to the penis, in the supposition that by directing this part, they straighten the urethra and make it straight, whereas they straighten only that part of the canal into which the catheter has already passed.—(John Bell's *Principles of Surgery*, vol. 2, p. 212.)

When the catheter is to be introduced with its convexity downwards, or by the "tour de main," the back is to be passed and the urethra, and the penis drawn over it, as it were, as in the foregoing method. In other words, the instrument, well held, is to be introduced, with its convexity upwards, as far as it can be without being bent. As soon, however, as the end of the catheter has reached the point at which the urine begins to flow, a curve under the penis, the surgeon is to make the penis and the instrument perform a simultaneous movement, by inclining them towards the right groin, and then towards the left groin. In the execution of this movement, care is to be taken to keep the back of the catheter stationary, so that it may be the centre of the movement, and simply revolve upon itself. This part of the operation, the object of which is to turn the convexity of the catheter upwards, ought to be done very slowly, a large sword being made with the handle, while particular care is taken not to retreat nor make the back from its position. The handle is then to be depressed, and the operation finished exactly in the same manner as when the first plan is pursued. As Desault properly observes, the only circumstance in which the two methods differ is, that in one the same thing is performed by two movements, which is done in the other by one; so that the operation is rendered more difficult and painful. Hence, many judicious masters strongly prefer practice the "tour de main," except when their patients are very robust, or placed in the position usually chosen for lithotomy, when other modes of introducing the catheter would be less convenient.

The depth to which the catheter has entered, the position of any swelling of the urethra, in the neck of the bladder, when retained upon its axis, and the point of the time, are the circumstances by which the surgeon knows that the instrument has passed into the bladder.

According to the experience of Desault, the practice of gradually lifting up a part of the urethra, after the catheter has been introduced, is by no means advantageous. He is, however, of opinion, that the opposite extreme, that is to say, of letting the urethra flow out of the catheter as fast as it is inserted; for then the bladder is kept constantly emptied, and the detrusor muscle will not be likely to recover its tone. When the bladder is constantly empty, it is liable to come into contact with the end of the catheter; a distension which has sometimes caused considerable irritation, pain, and even absorption of the urethra. Be-

sides these inconveniences there are some others; the catheter is more obstructed with mucus, and covered with incrustations, than when it is closed with the stylet. The patients are likewise obliged to remain in bed, where they are either wet with their urine, or compelled to have incessantly a pot for its reception. The best practice therefore, seems to be that of leaving out all the urine as soon as the catheter is introduced, and then closing the instrument until the bladder has become moderately distended again; for experience proves, that with moderate distention and relaxation of the muscular fibres of the bladder, alternately kept up, have the same good effects upon that organ as moderate exercise has upon other parts of the body. When a catheter is to be left in the urethra, it should always be properly fixed with a narrow piece of tape, or tied if it is apt to slip out, or even pass too far into the urethra.

For this purpose, most surgeons use cotton-wool, which they tuck in the rings, or round the external end of the catheter. The inconveniences of this thread are then carried some way along the direction of the penis, when they are tied together, and afterwards conveyed in opposite directions round the part all they most apprehend it, where they are tied in a knot. When a silver catheter is employed, a tape or narrow ribbon is passed through each of the rings, and extended to each side of the penis, where it is fastened to a circular bandage. Mr. Huxley remarks, that the ingenious but trifling contrivance afterwards adopted, of tying two or three rings are fixed on each side of a thin piece of tape, and the ring of the catheter is fastened to any of these with a piece of tape.—(On the Venereal Disease, vol. 2, p. 120.) He also notices another method: When the catheter (copper) is fixed in the bladder, the other end is drawn downwards nearly in a line with the body. To keep it in this position, we may take the common strap or belt part of a bag-truss with two thigh straps, or the fixed to it or hooked end, and coming round each thigh forwards by the side of the scrotum, to be fastened to the belt, where the end of the bag may usually find it. A small ring in 1794 may be fixed to each strap just where it passes the scrotum or root of the penis, and with a piece of wool tie the ends of the catheter may be fixed to these rings, which will keep it in the bladder. It seems Mr. Huxley did not like Broust's contrivance of leaving the catheter undisturbed, and he adds, therefore, "a bit of rag about four or five inches long, with a hole at the end of it, passed over the external end of the catheter, and the lower end allowed to hang in a basin placed between the thighs, will catch the water, which cannot discharge itself from the catheter, and keep the patient dry; or if another piece is introduced into the catheter, it will answer the same purpose."—(Op. cit. p. 121.) The following, which is the French method of retaining the catheter in the bladder, is the most convenient with which I am acquainted:—A muslin ring, the circumference of which should be more than sufficient to encircle the penis, so to be covered with cloth, and four long pieces of tape, with the same number of short ones, attached to it. This ring, enclosing the penis, is fixed against the scrotum by the long pieces of tape, which, encircling the penis in different directions, meet and are tied posteriorly. One of the short pieces is slipped through the ring or over the groove of the catheter, as each side, and being tied to its fellow, fixes the instrument securely in the bladder."—(See *Journal of Operative Surgery*, p. 155.) But there are numerous modes of fixing a catheter which need not be specified; for although the use of instruments, the introduction which should be observed in slipping them are the main things to be understood. These are, first, never to fix a catheter in such a way that too much of the instrument projects into the cavity of the bladder (*Lithotomy, Perforation de la Vessie par les Nouvelles*, &c. *Revue Méd. Nov. 1825*, p. 226); and secondly, to be careful that the thread or tape which is applied will not chafe and irritate the parts.

Mr. Hey has offered some good practical remarks on the introduction of the catheter. If, says he, the point of the catheter be less turned up than the urethra, the point will be pushed against the posterior part of the prostate, instead of following the course of the canal. The posterior part of the urethra has a weak resistance to it which can support it, and no considerable degree of force will push the point of the catheter

through that part between the bladder and the rectum. If the accident is avoided, still the point will be pushed against the prostate, and cannot enter the bladder. Mr. Hey believes, that the truth of this is illustrated by the microscope which is denied. Whenever the catheter stops at the prostate, soon elevating the point of the instrument with a finger introduced into the rectum.

Mr. Hey takes notice of the impropriety of passing forwards the point of the catheter before the bladder is sufficiently depressed, as the point would seem to be horizontal direction, and be likely to rupture the posterior side of the urethra.

For a facility arising from the inflamed and dry state of the passage (which certainly I should conceive may never be cured), Mr. Hey says, may be obtained by the previous introduction of a sponge well covered with lard.

In order to pass the catheter, Mr. Hey places the patient on a bed, in a recumbent posture, his head ascending to, or projecting a little beyond, the edge of the bed. If the patient's feet cannot rest upon the floor, Mr. Hey supports the right leg by a stool or by the hand of an assistant. The patient's head and shoulders are elevated by pillows; but the lower part of the abdomen is left in a horizontal position. Mr. Hey constantly introduces the catheter with its curvature towards the scrotum, and having gently pushed down the point of the instrument, till it becomes stopped by the curvature of the urethra, under the symphysis pubis, he turns the handle towards the thigh, pressing at the same time its point. In making the turn he sometimes keeps the handle at the same distance from the patient's shoulders, and sometimes makes it gradually rotate; but in either manner, he avoids pushing towards the point of the catheter any farther than is necessary to carry it just beyond the angle of the symphysis pubis. When he finds this point to period that must be, pulls the catheter point towards him, looking, as it were, the point of the instrument upon the penis. He then depresses the handle moving it towards the angle of the pubis; the course of which is the angle of the pubis. When the handle of the catheter is brought into a horizontal position, with the convex side of the instrument upwards, he pushes towards the point, keeping it close to the internal surface of the symphysis pubis; for when passing in this direction it will not touch upon the prostate gland, nor upon the membranous part of the urethra.

If the catheter were a flexible catheter, covered with elastic gum, it is of great consequence to have the outer ends of some thin malleable substance, and of a proper thickness. Mr. Hey always makes use of brass wire for the purpose. If the stylet is too slender, the catheter will not preserve the same curvature during the operation; and it will be difficult or unable the point just upwards behind the symphysis pubis in a proper direction. If the stylet is too thick, it is introduced with difficulty.

When the stylet is of a proper thickness, this instrument has one advantage over the silver catheter, which is, that its curvature may be increased while it is in the urethra, which is often of great use when the point approaches the prostate gland. In all cases where a elastic gum catheter is employed, care must be taken that it does not pass unnecessarily far into the bladder; and, if it is too long, a part of it ought to be cut off, or a shorter one employed.

In many cases elastic catheters, fixed with a permanent curvature, so as to affect of being introduced without a stylet, are mischievous.—(M. J. Chalmers, *Revue des Chirurges*, 2. p. 127, *March* 1827.)

When the proper resistance will a silver catheter do not succeed, the surgeon must change it, taking a bigger or more slender one, with a greater or less curve, according to your observations as to what may be the best attempt. But if the catheter has been of a good form or occasionally one, yet has not passed easily, be steady, instead of closing a rigid catheter of another size or form, take a flexible one for his second attempt. The flexible catheter is generally slender, and of sufficient length, and no stylet may be necessary in all occasions, and in all forms of the urethra. By having a stiff wire, we can give that wire, either before or after it has passed into the catheter, whatever shape we please; and what is of still greater importance, we can introduce the instrument without it

with the wire, in circumstances easy enough; or what is more advantageous, we can introduce the wire particularly so as not quite to reach the point of the catheter, but only to hold the two inches or a little more of that part, by which instrument the point of previously warmed and softened in the hand, has so much elasticity, that it follows the precise curve of the urethra, and yet has sufficient rigidity to overcome any slight resistance. If this fails, and especially if there be the slightest reason to suspect that the resistance is unusually excessive, but arises from stricture near the neck of the bladder in a young man, or swelling of the prostate in an old one, we may take a small bougie, turn up the extremity of it with the finger and thumb, so as to make a figure towards the penis, and allowing pressure for the wire to be softened, pass it quickly down to the stricture, turn it with a vertical or twisting motion, and make a gentle transverse part, withdrawing it to about ten minutes or a quarter of an hour, the same gently repeated, or the catheter may now be introduced.—(See *Sur's Principles of Surgery*, vol. 2, p. 355.)

Mr. Hey found, that of withdrawing the point of an elastic gum catheter, the instrument becomes more curved; and he treated himself to this operation, by withdrawing the style, so he introduced the catheter beyond the neck of the penis, by which action the point was raised in the due direction. He says, that may sometimes, though not always, succeed in introducing an elastic gum catheter, by using one which has acquired a considerable degree of curvature and firmness by having had a curved steel rod in it a long while. Introduce this within the urethra, with its convexity towards the abdomen, taking care not to push on the point of the instrument, after it has reached the sigmoides plicae, until its handle is depressed into a horizontal position.

When it is necessary to draw off the urine frequently, and the surgeon cannot attend often enough for this purpose, a catheter must be left in the urethra till an accident or the patient himself has treated the mode of introducing the instrument.

Mr. Hey inquires the formation of a false passage, or the rupture of the membranous part of the urethra, generally to the method of passing forwards the catheter before an abscess has been depressed. In this manner, the course of the instrument crosses that of the urethra, and the point of the catheter, pressing against the posterior side of the membranous part of the urethra, is easily forced through the coats of that canal. The word of this operation in the catheter, and of a false passage in its point, greatly contributes to facilitate the surgery. When it has now happened, the point of the instrument passes more readily into the wound, than along the urethra against the sigmoides plicae; and a great deal of skill is requisite to prevent this disadvantageous occurrence from repeatedly taking place, and rendering the case more and more serious.

Mr. Hey mentions a difficulty of this kind, by sending against the point of a silver catheter, so as to keep it more closely in contact with the anterior part of the urethra, and thereby pass into the wound made in the posterior side of the canal. In the instance alluded to, as it was necessary to leave an elastic gum catheter in the urethra, Mr. Hey proposed some means of a proper thickness, with which to make a strict, and having given it the same curvature as that of the silver catheter, he introduced it about four hours after the preceding operation, and fixed it by tying it to a ringlet. Mr. Hey sometimes succeeded by partly withdrawing the style at the moment when he wished to increase the curvature of the catheter.

In an instance in which the urethra had suffered a violent contusion, Mr. Hey drew off the urine with a silver catheter of unusual thickness, after he had fitted with instruments of a similar form. He suspected that the urethra was ruptured, and was obliged to raise the point of the catheter by a finger introduced into the vagina, and to use bleeding, purgatives, two or three grains, and often before it could be made to pass. The elastic gum catheter was after used employed. It was as quartered point, whether it is best to leave the catheter in the urethra until the power expelling the urine is revived, or to draw off the urine twice a day, and withdraw the catheter after each evacuation. Mr. Hey thinks that a general rule can be laid down; namely, to leave the catheter in the urethra to remain introduced;

others seem to suffer no inconvenience from it. On the whole, however, Mr. Hey commonly prefers removing the catheter. In this manner, he is of opinion, that the power of expelling the urine again is sooner acquired.

The preceding question is often determined by the nature of the disease, and as Mr. Hunter observes, in cases of *stricture* of the bladder, and where a catheter passes with difficulty, or with great inconvenience, as well as in other instances in which it must be used frequently and for a length of time, it will be necessary to keep it introduced, so as to leave the water to pass freely through it.—(On the *Stricture Disease*, vol. 2, p. 131.)

In France, a crystal silver catheter (*probe opaque*) is frequently employed in difficult cases by Boer, Roux, &c. This instrument has a very slight curvature, and an extremely smooth point. By force, regularly applied, it is introduced into the bladder in spite of all opposition. Care is taken to keep it in the centre of the passage, and the direction of its point is judged of by the position of the lateral angle. The tube introduced by Boer, for counteracting the great depression of the outer extremity of the instrument is taken, by the difference in the texture, the point can be seen to have reached the apex of the prostate.—(See *Stricture of the Bladder, Addressed at Paris*, by J. Cruveilhier, p. 118.) In bad cases the crystal catheter is usually allowed to remain introduced three or four days, and on being withdrawn, a small flexible gum catheter generally admits of being used.

The double manner in which the French surgeons employ the crystal silver catheter, seems often to give well-informed observers. Thus, in two examples, which were mentioned and examined by Roux himself after the disease of the prostate, a false passage had been made, no flexible gum catheter could be passed, the urine was effused in the cellular membrane, and the parts were gangrenous.—(See p. 116 of the above work.) According to the observation of Mr. Cruveilhier, the French surgeons employ the crystal silver catheter with too little discrimination, and "in their practice they seem to make no new distinctions between impediments to the flow of urine from the bladder, and adhesion and suppuration of the prostate gland, and suppurative structure of long duration. If the crystal catheter be introduced at all, it is in the last of these cases, particularly when combined with female stricture; and none of the surgeons who are familiar with the treatment of diseases of the urethra, occasionally are aware which approach very closely to the forcing method of the French. I have heard of instances, in which John Hunter employed great force both the silver catheter, and against the obstruction. I have seen Mr. Pearson (who generally treats catheters as rigid), and I need hardly say, as occasionally as any means take a shock, and push it gradually and forcibly on into the bladder, at the same time forcing his way, as it were, by keeping one finger in the rectum: the relief of the patient, and the ultimate cure of the disease, were the results of this practice."—(P. 118.) It appears further, that the crystal silver catheter has been used by M. A. Cooper. Whether altogether considering the conventional employment of this instrument, I perfectly coincide with Mr. Cruveilhier, that it is one with which young men, of little candour and no experience, may do more harm in the first few cases they meet with, than the rest of their life will afford them opportunities of doing good.

Mr. Hunter refers to instances in which the common catheter had been pushed through the preputial part of the prostate gland into the bladder, and the water then drawn off; but, "in one patient the blood from the wound passed into the bladder, and increased the quantity of matter in it. The use of the catheter was stopped a second time; but not succeeding, I was sent for. I passed the catheter into it again to a stop, and then suspecting that the part of the prostate projected forwards, I introduced my finger into the stricture and laid that gland very nicely exposed. By depressing the handle of the catheter, which of course raised the point, it passed over the projection; but unfortunately, the blood that was in the bladder, which filled up the hole in the catheter, so that I was obliged to withdraw it, and clear it repeatedly. This I repeated several days; but suspecting that the coagulum about it the end kill, I stopped cutting the

Mixed surfaces, in order to maintain a discharge. The cerium salina, however, which answers much better, and is not attended with danger of drying or straggling, inflammation of the eyelid, &c., has almost superseded the cerium cartharidis.

CERATUM CETACEUM. (L.) The spermated cerate. A mild, emollient, saline for ceration purposes.

CERATUM CONDI. (L.) *Ceratium conditum* (L.) (See *Emplastum*.) *Ceratium* (L.) *Ceratium* (L.) (L.) One of the salines at St. Bartholomew's Hospital, occasionally applied to cancerous, scrofulous, and phlegmatic sores.

CERATUM HYDRARGYRI SUBMURIATIS. (L.) *Hydrarg. submurat.* (L.) Cerate liquid, submuriat. (See *Mercur. praeparationes* are partial to this as a dressing for chancre.

CERATUM PLUMBI ACETATIS. (L.) A mild, emollient, neutralizing salve.

CERATUM PLUMBI COMPOSITUM. (L.) An excellent gently antiseptic salve for ceration purposes.

CERATUM SAPHNE. (L.) *Sabine foliorum extractum confusum* (L.) Cerate liquid, saphne. (See *Preparationes*, &c.) Mix the sassa with the sassafras and the sassafras, and strain the composition.

The cerate application for keeping open blisters, on the skin recommended by Mr. Crockett—(See *Blister*.)

CERATUM SAPONIS. (L.) *Ceratium saponis* (L.) Cerate liquid, saponis. (See *Preparationes*, &c.) Mix the sassa with the sassafras and the sassafras, and strain the composition.

The way of ceration at St. Bartholomew's Hospital, in preparing it, the cerate cerate must be used. The first three ingredients are to be mixed together and boiled gently till all the moisture is evaporated; after which the wax and oil, previously melted together, must be added. The whole composition, from first to last, must be incessantly and continually stirred, without which the wax will be spoiled. This formula was introduced into practice by Mr. Dorr, and is found to be a very convenient application for ceration and ceration, being of a mild, emollient, neutralizing degree of alkalinity, and at the same time possessing the usual properties of a cerate cerate.

In applying that cerate, spread it level, in thickness of the leg or arm, or whatever is necessary to be observed, namely, that it be in two distinct pieces; for if, in one piece, the skin is encircled by it, and the ends overlap each other, it will leave a very inconvenient and partial constriction of the fractured part, in consequence of the subsequent contraction. (See *Pharm. Chirurg.*)

CERUMEN ALBID. A degree of leanness is frequently produced by the indigestion of hard dry pellets of this substance in the nostrils and nostrils. The best plan, in such cases, is to sponge the ear with warm water, which should be repeated with moderate force.

In some instances, leanness seems to depend on a defective secretion of the cerumen, and a consequent dryness of the nostrils. Here, a drop or two of almond oil may now and then be introduced into the ear, and frequently applied.

CERUMEN ALBID. A degree of leanness is frequently produced by the indigestion of hard dry pellets of this substance in the nostrils and nostrils. The best plan, in such cases, is to sponge the ear with warm water, which should be repeated with moderate force.

CHAMÆLEON. (From *chama*, a lizard, and *leon*, a lion.) A lizard, the habits of the lizard, which has been historically supposed to resemble a lizard. When the lizard is in the sun, it does not creep, but changes into a hard, fleshy mass, it receives the application. (See *Medicinal*.)

CHAMÆLEON. The flowers, which are finer and aromatic, are used as surgery for making emollients.

CHANCER. (From *chama*, a lizard, and *leon*, a lion.) A sore which arises from the direct application of the venereal poison to any part of the body. All sores of this kind are called chancres. Each venereal sore is made out from a general contamination of the system, in consequence of absorption, never have the same chance applied to them. It is in accordance of the nature and treatment of chancres, see *Venereal Diseases*.

CHENOPHIL. (From *chama*, a lizard, and *leon*, a lion.) A lizard, the habits of the lizard, which has been historically supposed to resemble a lizard. When the lizard is in the sun, it does not creep, but changes into a hard, fleshy mass, it receives the application. (See *Medicinal*.)

lent, it frequently happens, that lymph or blood is effused in the cellular membrane, which connects the cornea with the anterior lamellae of the eye, hence, the latter membrane is gradually elevated upon the eyeball, and projects towards the eye, so as to conceal within it the cornea, which appears as if it were depressed. In this way the middle of the eye assumes the appearance of a gap or aperture.

It is observed by Mr. B. Wilson, that if temporary chancres are generally dependent on the lymph swelling of the venous fibres, but that it may also partly arise from effusion. He notices a very firm, but pale, chancrous, as occasionally produced by effusion, and resembling a solid ulcer, or fist. In one case of this sort which fell under his own observation, there were numerous white spots on the venous surface. (See *Prick on Diseases of the Eye*, note, p. 12.)

The time has arrived when surgeons had faith in the application of the vapour of ether, or of an ignited decoction of the sweetened acids, to an inflamed eye, for the relief of chancres, as recommended by the late Mr. Ware. In this kind of case, more benefit will result from general treatment than from any local treatment. I have particularly relied on the salutary system of Mr. Ware, in certain chancrous cases, like first species of Mr. Wilson, topical remedies may be advantageously resorted to.

Acute ophthalmia, attended with chancres, demands the most vigorous employment of the antiseptic treatment. Both general and topical bleeding should frequently and copiously put in practice, with the required, however, to the age and strength of the patient. Leeches should be applied to the vicinity of the eyelid; or, what is preferable, the frequent use should be resorted to. When chancres are very considerable, Scarpa's method of making an incision in the conjunctiva, near its junction with the cornea, for the discharge of the lymph or blood lodged under the diseased membrane. (See *Ophthalmia*.)

CHIRASTIC. or *Chirastica*. A double-headed roller, the middle of which was applied to the chin; the bandage then crossed at the top of the head, and passed on each side to the nape of the neck, where it crossed again. It was then carried up to the top of the head, and so on, till all the roller was exhausted.

CHIRASTIC. A bandage for stopping haemorrhage from the temporal artery. It is double-headed, about an inch and a half wide, and four feet long. Its middle is applied to the opposite side of the head; the bandage is carried round to the bleeding temple, and there made to cross over a compress on the wound. The roller is then extended over the coronal suture, and under the chin, care being taken to make the bandage cross upon the compress. In this way, the rest of it is applied round the head.

CHILBLAINS are the effect of inflammation arising from cold. A chilblain, in its mildest form, is attended with a moderate redness of the skin, a sensation of heat and itching, and some or less swelling, which disappears, after a time, spontaneously disappears. The inflammation changes and sense of tingling, accompanying the inflammation of the middle description of chilblains, are observed to be frequently aggravated by exposure to heat. In a more violent degree, the swelling is larger, redder, and sometimes of a dark blue colour; and the heat, itching and pain are so excessive, that the patient cannot use the part. In the third degree, small vesicles arise upon the tissue, which burst and leave excoriations. These often change into ill-conditioned sores, which sometimes penetrate even as deep as the bone, discharge a thin ichorous matter, and finally prove very obstinate. As Dr. John Thomson has remarked, "when the serum contained in the vesicles is let out by a small opening, a portion of new granule is usually formed to supply the place of that which has been separated; but when the inflammation is violent, and the affection neglected, or improperly treated, the parts which are the seat of venous are liable to pass into the state of venous ulcers. In this state, they yield to the chancrous or scrofulous discharge, and are generally healed, only after a long time, and with great difficulty, to a healthy appearance. In neglected cases, these ulcers not infrequently become covered with fish sloughs. Ulcers often supervene, and the soft parts covering the bones are destroyed." (On Inflammation, p. 63.) The worst stage of chilblains is attended with sloughing.

thickness of the granules. When granulations are formed upon a fixed surface, their contraction is mechanically impeded; as, for instance, on the skin, the hair, &c. Hence, in all instances on such parts, as much skin should be saved as possible.

The shape of a sore, as well as its situation, makes also a considerable difference in its granulations: first, as Mr. Askey (who has remarked, a sore of a circular form, extends peripherally, till it ceases to granulate, then another of a more elongated form has less diameter.—*Forrest*, vol. i, p. 223.)

When there has been a loss of substance, making a hollow sore, and the contraction of the granulations has begun, and made a good deal of progress, before they have had time to rise as high as the skin, then the edges of the skin are gradually drawn down, and turned as it is in the hollow direction of the surface of the sore.

The contraction of the granulations continues till the healing is complete; but it is greatest at first. Then there is a mechanical resistance to contraction, is proved by the assistance which must be given to the process by the application of a bandage.

Second, the contractile power of the granulations, there is a certain power of the surrounding edges of the granulating skin, which resists the contraction of the granulations, and is generally more considerable than that of the granulations themselves, drawing the mouth of the wound together like a purse. The contractile power of the skin is confined principally to the very edge where it is contracting, and, as Hunter believed, to two very granulations, which have a ready resistance, for the nature of organic skin surrounding this part does not contract, or at least not nearly so much, as appears by its having been drawn out folds and flaps, while the new skin is smooth and elastic.

The form of the contraction of granulations are various. It is evident, the healing of a sore, at there are two openings, going on at the same time, the contraction will proceed.

It avoids the formation of marks on skin, the advantages of which is evident: for it is with the skin as with all other parts of the body, viz. that such as are originally formed are much more fit for the purpose of life than those which are newly formed, and not nearly so liable to absorption.

When the whole surface of a sore has skinned over, the secondary, the remains of the granulations on which the new skin is formed, still continue to contract, till hardly any thing more is left than what the new skin would hold. This is a very small part, in comparison with the first formed granulations, and it is in time looks most of its original vessels, becoming white and ligamentous. All newly healed sores are at first redder than the common skin, but in time they become much whiter.

As the granulations contract, the surrounding old skin is stretched to cover the part which is deprived of skin.

When a sore begins to heal, the surrounding old skin, close to the granulations, becomes smooth, and round with a white cast, as if covered with something white. Thus, Mr. Hunter supposed to be a healing cuticle, and it is as soft and more a symptom of healing as any. While the sore retains its red edge all round, for awhile a quarter of half an inch is healed, we may be certain that it is not in a healing state.

Skin is a very different substance, with respect to texture, from the granulations upon which it is formed; but it is not known whether it is a new substance formed by the granulations or a change in the surface of the granulations themselves.

The new skin then constantly takes its rise from the surrounding old skin, as if it flowed from it; but, according to Mr. Hunter's theory. It is very long before the principle of skin, in which the edges of the surrounding old skin had little tendency to contract, and the cellular membrane underneath is rigid, or the old skin is become drawn over the granulated surface, the granulations do not appear a contracting disposition. In such cases, new skin forms in different parts of the floor, making up the surface of the granulations like little islands.

This power of the nature of a sore to form new skin, however, is not universally allowed; and while Mr. Askey Cooper acknowledges the fact of increased secretion of skin being sometimes seen in the middle of

sores, nevertheless, this such appearance is produced in consequence of the whole of the skin not having been destroyed by absorption, and granulations having arisen from the part of the skin which was left. Thus, he says, and I suppose to irregularly formed sores, where, after the healing process has gone on to the centre, the new breaks out again at the circumference.—(*See Lancet*, vol. i, p. 223.)

Whatever change the granulations undergo to form new skin, they are generally guided to it by the surrounding skin, which gives this disposition, in the surface of the adjoining granulations.

The new-formed skin is never so large as the skin was on which it is formed, owing to the contraction of the granulations, and the yielding of the surrounding skin. If the sore is situated where the adjoining skin is loose, as in the scrotum, then the contractile power of the granulations being quite lost from obstruction, a very little new skin is formed; but if the sore is situated where the skin is held at tense, the new skin is nearly as large as the sore.

The new skin is at first continuous on the same level with the old. This, however, is not the case with sores and ulcers, which frequently heal with a cicatrix higher than the skin, although the granulations may have been high from rising higher than this part.

The new-formed skin is either as yielding not so elastic as the original; or it is also less movable. It gradually becomes, however, more flexible and loose. At first it is very thin and tender, but it afterwards becomes firmer and thicker. It is a smooth continued skin, not formed with those irregular undulations which are observed in the natural or original skin, and by which the latter admits of any distension which the cellular membrane itself will allow of.

The new skin, and indeed all the substance which had formerly been granulations, is not nearly so strong, as the originally formed parts. The living principle itself is less active; for when an old sore breaks out, it continues to yield, till almost the whole of the new-formed matter has been absorbed, or has exfoliated.

The young skin is extremely full of vessels; but they afterwards disappear, and the part becomes white. Hence the white appearance of the cicatrices or marks of granulation.

The surrounding old skin being drawn towards the centre by the contraction of the granulations, it then has loose folds, while the new skin itself seems to be open the stretch, having a smooth shining appearance.

The new cicatrix is more easily formed than the skin, than the skin itself from granulations. Every part of the surface of the skin is concerned in forming cuticle, so that not a forming equally over where it does; but the formation of the cuticle is principally, if not entirely, progressive from the adjoining skin.

The new cicatrix is at first very thin, and rather pulpy than leathery. As it becomes stronger, it looks smooth and shining, and is more transparent than the old cuticle.

The rate of progress is later in forming than the cuticle, and in some cases never forms at all. In blacks, who have been regarded as slow, the cicatrix is a considerable time before it becomes dark; and in one black whom Mr. Hunter saw, the cure of a sore, which had been upon the leg when young, remained white when he was old. This case, however, must have been an unusual one; for it is now mentioned that the new skin of a negro does not become white, but is at first red, and after a time turns blacker than the original skin.—(*See A. Cooper, Lancet*, vol. i, p. 227.)

According to this gentleman's observations, tendons and cartilage are the only parts of the body incapable of being regenerated in the process of cicatrization; when a tendon is divided, it unites by means of a firm dense substance; and, except in very young subjects, the cartilages of the ribs irreparably unite with the intervening bone.—(*Hunter, On the Blood, Inflammation, &c. Philosophical Lectures on Inflammation*, p. 248, 249.)

CICUTIA. See *Cactus* *Reichenow*.

CINCENSA. An one of the designs of this Dictionary is to explain the subjects of a varied phenomena, Peruvian bark, which is administered in a very great number of various cases, seemed to present only in effect.

The first regard for its action in stopping vomiting

them, and recommending the rejection of the stomach, every person, whether of the medical profession or not, has frequently heard of. Indeed, so high is the character of this medicine, that many practitioners, before it is so much as a matter of almost every disease, often prescribe it when it is totally useless, give it when it actually does harm, and make their patients swallow such quantities as create perturbation, when smaller doses would effect striking benefit. Some men are credulous enough to think, that from the Tonic bark's vigor and strength are directly connected and inferred the constitution, in most proportion to the quantity of the medicine which the stomach will keep down and digest.

With a decline of this sort, perhaps, we must expect to see infirmities and symptoms practice. The quantity of disease will always be attended with an expenditure of language and weakness, and certainly, while there exists a supposition that a drug is of benefit, procuring the quality of evoking and maintaining strength, it would be absurd to fancy that so important an article will not be highly exhausted in a multiplicity of medical cases. I need not presume to furnish an idea of the power of the Tonic bark in the practice of physic; but I have not the least doubt that they have been unwarrantably compressed in surgery, as in a kind and prolixo space, a continuance of good diet, and local ties to adopt, together with simple methods of treatment.

Under peculiar circumstances, bark has undoubtedly the quality of increasing the tone of the digestive organs; and, of course, whenever the indication is to strengthen the system by stimulating food, and the appetite fails, this medicine may prove of the highest utility, provided it be given in moderate doses, and if it be found to agree with the stomach and bowels. For the plan of making the patient swallow as much of it as can be got into his stomach, even, in my opinion, he inevitably followed by bad instead of good effects. How can it be reasonably expected that the stomach, which is already out of order, can be so right by taking an immoderate quantity of any drug whatever forced into it? In fact, if the alimentary canal were in a healthy state, would not such practice be likely to throw it into a disordered condition?

Bark is an excellent medicine when judiciously administered; but, like every other good medicine it has faults, it may be the means of producing the worst consequences. How much good does every effort to eradicate tumors of surgical disease, when prevented by a surplus of emaciation; what a poison it becomes under the direction of an ignorant practitioner! With respect to cases of indigestion, bark is often most strongly indicated when the vomiting is not accompanied with active inflammation, when the patient is debilitated, and his stomach cannot take nourishment. I have always regarded the notion of giving bark as a specific for gastritis as totally unfounded and absurd. I have witnessed its effects in these cases, but could never discern that it had the least peculiar power of operating directly upon the parts which are diseased. Whatever good it does is by the improving the tone of the digestive organs, and making them more capable of carrying nourishment, and of course through into the circulation.

I should feel myself guilty of a degree of partiality in speaking thus freely upon this subject, were not my sentiments in some measure supported by those of foreign celebrated writers, the remembrance of whom will always be aided with undigested veneration and esteem. Mr. Samuel Hahnemann has not hesitated to bark, and while he allowed it to possess a share of efficacy, he would not admit that it was capable of miraculously dissipating every disease which the stomach is prejudicially affected. "I know," says he, "it will be looked upon by many as a kind of sleepism, to doubt the efficacy of a remedy so well attested by even an infirmity of taste; and yet I shall frankly own I have never clearly to my knowledge met with any evident proofs of its preference in the medical indication merely prescribable though I have a long time made experiment of it with a view to search into the truth.

Perhaps it may seem strange then to suppose a doctrine established on what is called matter of fact; but I shall have observed that in the practice of physic and surgery it is often exceedingly difficult to ascertain a fact. Prejudice or other obstacles sometimes pre-

clude us from judgment, where there is evidently a right and a wrong; but in certain cases so distinguished from the remedy and how the nature operates, is probably above our discernment. In gastritis particularly, there is frequently such a combination of an known circumstances as cannot but lead to diverse an erroneous observer. Modifications arising from cold, compression, or structure, particularly in relation to the veins, and are therefore, many other causes for proving the power of the bark. However, there are two kinds of gastritis where cinchona has a superlative; these are a spreading gastritis from a violent cause, and a spreading gastritis from violent external causes, such as great cold, wounds, contusions, &c. Yet even here we cannot judge of their effect with absolute certainty; for sometimes a healthful reaction from several causes is a kind of critical disorder. These seems to be a certain portion of the body detaching period, and in some, of the way as a result of various things brought into our system. While the gastritis stops at a tolerable point without the least assistance from it. The same thing happens in the acute species of gastritis from cold, or cold, where the injury appears to be exaggerated to a certain distance and so forth; though, to the way, I shall remain in this place, contrary to the received opinion, that gastritis from these causes (where there has been no previous stricture of the vessels) are within reach as these from internal causes.

As I have here stated the bark, we now have difficult it is to ascertain the real efficacy of this medicine; but bark in any degree does wonderful effects in gastritis. While it has its peculiar indications, its preponderance would be more to be decided in the case than in the other. What, in my judgment, seems to have raised its character as high, are the great number of simple observations published on the subject, the others of which, not having frequent opportunities of seeing the facts of this disorder under the use of cinchona, &c., and some of these, perhaps, produced by the common supposition, that every gastritis is an inflamed state, have therefore excited a universal infatuation to the bark, when the crime has proved successful. (Sherris's first, second, &c. on Gastritis.)

Some further remarks on this subject will be received by the article Morphology.

According to Mr. Brissot, bark is a specific for old ulcers, where the inflammation seems concentrated at the bottom of an inch round the sore, the surface of the bottom looks glossy, and the discharge is constant thin and very odorous, with little or no sleep than the violence of the pain. The further advanced, the the addition of opium, or sometimes only opium, will often be found necessary. (Chirurgical Observations and Cases, vol. 1, p. 124.)

Bark is given so extensively in the practice of surgery, that there are few important cases in which it is certain circumstances, and administered in another, are not indicated. When persons have been weakened by a cerebral hemorrhage, or by the effects of any disease whatsoever, moderate doses of bark will frequently be found of great service. But it only becomes when the gastritis arises suggested, and as far as my judgment extends, this medicine should never be prescribed in any surgical cases in excessive and unattended quantities.

The use of cinchona in combination with one-fourth part of potassium or soda, is found of essential service as a tonic in the debility and constitutional irritation which are induced in some patients by the excessive use of mercury, and I learn from my friend Dr. Francis, that he has recently tested its efficacy in the same manner. In the mercurial sore-throat of long standing, it has proved an effective remedy, and as the use will be alleviated or combated with heat and other remedies in building the indications required in the same preparation. — *Done.*

The yellow bark, or the *assa cinchona cordifolia* of the botanists, is said to possess nearly equally the same pharmacopoeia, as to the general nature of the compound preparation of the species described, that the effects of the various kinds of cinchona make it an infallible tonic, or alkaline elements, instead of alkaline, and moreover, in that of being able to preserve the properties which will concentrate all the efficacy of the medicine in formulae of moderate bark, not likely at least to disorder the alimentary canal by the medicinal effects of quantity.

COLPOPTOSIS. (From *collo*, the vagina, and *ptosis*, to fall down.) A lowering or falling down of the vagina. (See *Vagina*, *Protrusion of*.)

COMMUNITED. (From *communis*, to break in pieces.) A fracture is termed comminuted when the bone is broken into several pieces.

CONJUGES. (From *conjugere*, to press upon.) Food, hairs, lint, or other materials, entering a sort of pad, which occupies place near those parts of the body on which they wish to make particular pressure; and for this purpose a bandage is usually applied over the conjuges. Conjuges are also frequently applied to promote all efforts which the pressure of hand but in a light language would otherwise diminish.

COMPRESSION OF THE BRAIN. See *Brain*, *Injuries of*.

CONJUNCTION OF THE EYES. See *Eye*, *Injuries of*.

CONDYLOMA. (From *condyla*, a tubercle or knot.) A small, very hard tumour. The tumor is generally applied to cancerousness of the description about the anus. The practitioners may either destroy them with caustic, or, if they have with a ligature, or remove them all at once with a knife; the first is generally the most, the last the best and most speedy method.

CONIUM MACULATUM. Hemlock. (Latin.) This is a medicine to which the observations in practice incident to so large a considerable efficacy in several surgical diseases. However, there is no doubt, that when it is represented as a certain cure for cancer and scirrhus, exaggeration is employed. It is an extremely ready for curable painful sort of the scirrhus kind, and it will dissipate the cure of many others in which the cancerous matter has been destroyed by surgery, though the healing does not proceed in a figurative way. However, in medicine hemlock is several scirrhus malignum, scirrhus, particularly cancer which are every now and then met with upon the tongue. It is an slightly alterative in cases of cold in the tongue, portage, and various hepatic affections. It has several several components of the female form give way to hemlock, combined with calomel. Some swellings of the female (as the) is the more common. However, certainly has not the power of curing cancer; but its narcotic properties tend to remove the pain of that disease, so as to render it by no means a considerable remedy in the treatment of that case.

Regarding hemlock, Dr. Parrish observes, that the extract and powder may be extremely given with evidently good effect in several irritable cases, whether they are connected with the active state of the venereal virus, or whether they remain after the completion of the venereal course; and a small dose, that the benefit conferred by the drug ought not to be ascribed solely to its venereal qualities, since diseases attended with cancer always be obtained by the direct exhibition of opium, even where it does not disagree with the stomach. He states that opium is almost a specific in the venereal ulcers which attack the corn at the end of the penis. With this fact and many frequently become gleet. Also, in venereal sores which are accompanied with great pain, and no appearance of considerable healing, hemlock will often remove that hurt, either, or calomel. The common mode of exhibiting hemlock is in the form of pills, made of the tartarous root, five grains in each. However, I have often thought three grains sufficient to begin with the dose being afterwards gradually increased, till several new large quantities may at last be taken at one time. Dr. L. Wilson, in his *Pharmacopoeia Therapeutica*, advises what a remarkable case of cancerous ulcers, for which the patient took a hundred and twenty pills, each consisting of five grains of the extractum, in twenty-four hours, and thus without any benefit being obtained, or any improvement in the patient.

The patient being a little disordered, and the head somewhat full, is a sign of the dose being sufficiently strong.

According to some writers, but more particularly Dr. Whistler, there are severe stages in which the virus of a venereal practitioner, in presenting this remedy, may be frustrated. The plan chosen for purging the system may not be the free evacuation of the blood, which is indispensable for the cure of the disease. It only not be suffered when in perfection, and it may be suffered when in perfection. The practitioner

of the cure may not have been performed in a temperate way, for the sake of blood, over a venereal disease. The course, of which the powder is made, may not have been carefully dried and preserved in a well-stopped bottle, or, if so, may still have been guarded from the effects of exposure to light. In both, the whole medicine may have suffered from the mere effects of long keeping. From any of these causes, it is evident, the proposed remedy may have suffered, and it happens, we could, very frequently, that the failure of it might, in fact, be attributed to one, or other of them. (See *Mercurius* *Chlorureus*, published in 1812, p. 174.)

The utility of hemlock is now found to reside in a resinous element, obtained separately by reprecipitating an ethereal tincture of the leaves on the surface of water. A dose of half a grain will produce warmth and headache. The watery extract of this plant has been proved by Orfila to have little power. (See *J. A. Paris*, in *Pharmacologia*, vol. 2, p. 181, col. 9.)

I have sometimes prescribed, as an alternative, with excellent benefit in several surgical diseases, a pill containing three grains of extractum conii, or, what is preferable, the dried leaves, one of hydragric substances (calomel), and one of antiscorbutic substances (vitellus). In various cases of scirrhus cancerous, and also in several very painful irritable ulcers and abscesses, it is occasionally employed in the form of hemlock in various positions. The leaves are generally made by mixing the powder with the common bread and water cataplasms. *P. Hoffman*, of Hemlock, has found, that *A. Struth*, *Leibnitz*, and *Democritus* examine an extract and extractum cataplasms, and of various remedies with little, or no effect, others, few, *Virchow* 1861. Also, *Supplementum Pharmacopoeiae de Conio*, by *Virchow*, 1861. *J. Pearson*, in the *Various Articles of the Materia Medica*, *de Med. Res. London*, 1867. *J. A. Paris*, *Pharmacologia*, vol. 6.

CONJUNCTIVA, GRANULAR. The following account of this subject is given by Dr. Frick. The disease is mostly the sequel of venereal syphilis. It is characterized by a rough, swollen, or granulated state of the palpebral conjunctiva, with a glossy or purulent discharge from its surface. The constant friction of the eyelids upon the globe brings on a various state of the venereal conjunctiva, and a daily appearance of the venereal. The patient complains of a sensation similar to that produced by sand, or other extraneous matter, under the eyelids, the eye cannot endure the light, and there is a troublesome epiphora. In the early stages, a cure is easily accomplished by the application of a few leeches to the eyelids, and purging the patient once or twice a day with the common tincture of opium, or the ergot of rye, &c. When these means fail, the sulphate of copper or nitrate of silver may be used, though not so freely as to produce a slough, but only to destroy the diseased condition of the part. (See *Frick*, *the Flow of the Eye*, p. 188, vol. 2.) Mr. H. Walbank recommends the use of these means to be followed by abstinence with tepid water, and the application of a few leeches. He also recommends counter-irritation and antiseptic. The upper eyelid, he says, should be completely everted in examination, as there is sometimes, in the angle where the conjunctiva passes from the globe to the lid, a crescentic, bluish fold, he called a cock's comb, not taking up a distinct, white, shining state of the cornea. Dr. Frick considers removal of the granular surface proper only when it is hard, insoluble, and persistent, or the excoriation being the progress from the surface of the eyelids. In this state, Dr. Virchow recommends the application of a little tincture of iodine, and then washing it off with a sponge. (See the article *Gonorrhea*, and *Frick*, *Treatise on Diseases of the Eye*.)

EXTENDED WOUNDS. See *Wounds*.

CONTUSION. (From *contundere*, to bruise.) A bruise. A slight bruise seldom meets with much attention; but when they are severe, very bad consequences may ensue; and these are the more likely to occur, when such cases are not taken proper care of.

In all severe bruises, besides the inflammation which the violence necessarily occasions, there is an extraordinary effusion, in consequence of the rupture of many of the vessels of the part. It is not that very few we account for these very considerable tumours, which often rise immediately after injuries of this nature. The black and blue appearance (initially following many bruises) can only be explained by some thing

It is observed, that a simple incision through the varicose vessels is not permanently efficient in destroying all direct communications between the crura and plexiformities of these vessels upon the ovum, after such an incision made, the discharge, with a hæmorrhage, it is true that a separation of the vessels of the divided vessels follows in opposite directions, it is no less true, that in the course of a few days afterwards, the mouths of the same vessels approximate each other, and reunite, so as to restore their former continuity. Hence, to derive from this operation all possible advantage, it is essential to extirpate with the knife a small portion of the varicose phloids, together with the adherent portion of the tunica connectiva.

The vessels are to be separated from the uterine artery by a skilled assistant, who is, at the same moment, to support the patient's head upon his breast. The surgeon is then to take hold of the vascular vessels with a pair of small forceps, near the edge of the uterus, and to lift them a little up, which the lax state of the surrounding tendons may; then, with a pair of stout, curved scissors, he is to cut away the pieces of tunica vaginalis, together with a small piece of the mesometrium, making the vessel of a scissor-like form, and as near as possible to the uterus. If it should be necessary to operate upon more than one placenta or uterine vessels, situated at some distance apart, the surgeon must elevate them one after the other with the forceps, and remove them. After which they are very close together, and occupy every one of the exp. In most cases, an undivided circular incision in the vagina, making it nearly to the margin of the external os, and so as to divide with the scissars all the uterine vessels.

This being done, he must allow the cat to come to blood freely, even passageway, the hemorrhage by loosening the eyelids, until the blood discharges in flow. Scarify then cover the eye with an oval piece of the compressing sponge and a restorative liniment. The eye ought not to be opened till twenty-four hours after the operation, when, usually, the agency of the vessels will be found completely obliterated; and, during the ensuing days, the patient is to be enjoined to keep the eye wet, and covered with a bit of fine rag. A collyrium of milk and rose-water, warm, may be applied two or three times a day. When the inflammation of the conjunctiva happens, about the second or third day after the operation, particularly is rare in which the lesions is made all round, while the greater part of the upper of the eye remains, a slight circle, in the place of the incision, forms a line of boundary in the redness which does not extend farther upon the cornea. This inflammation of the conjunctiva, with the aid of internal ophthalmologic remedies and topical remedies, abates in a few days, and then pus is secreted along the track of the incision in the conjunctiva. The wound contracts, and, growing smaller and smaller, soon cures. Raising the eye with warm milk and rose-water is the only local treatment necessary in this stage of the cure.

Thus, not only the first journey of the poem is improved, but also the prestructural fixity of the country is dissolved, or even removed. When the conformation subsequently appears relaxed and wrinkled, in the use of typical adjectives and metaphors, and of Latin's ophthalmic castigation, may be easily identified a preceding the occurrence of the viscous state of the poem. — (Karl's public *Madellé* shall think — N.Y.)

According to the representative of Dr. Vesseli, Bulgaria's chief of removing the poisons of carcinoma venodis, together with a portion of the accompanying, produces no good effect. "Symptoms of cancer of breast enlargement of the metastases involving the eye." He believes, that some women's extraordinary response to the toxin of those removed, and the good blessed from the bleeding does not correspond to the irritation produced by the operation—(A Practical Treatise on the Haematuria of the Eye p. 80.) However, whilst it is reflected, that surgery of this practice only for advanced cases, and particularly metastases beyond retrograde for the advanced stages of the disease, he heartily agrees with the report, as far as that point is concerned. The European movement of the disease and its treatment is left unaltered by the outbreak of any notion of the children repeatedly existing between dignity of the disease, and

eyelids. Yet, perhaps, *desmops* was not to be exposed in view of this condition in his chapter on *desmops*, because his definition of this superficial opacity will not altogether suit the affection of the same name as referred to in the following observations. It is marked by Dr. Vetch, that after the complete closure of conjunctival *desmops*, as far as regards that portion of the membrane which covers the eye, the villosity, elongation of the vessels of the lining of the eyelids, instead of moving, their natural state, acquire a farther interval of size, so as to produce a rough, scaly, or granulated surface, with a secretion of puriform mucus. The striation of this *desmops* variety gradually induces an indolent state of the sclerotic cornea, and, consequently, a greater flow of blood towards the cornea: the superficial vessels become varicose; the conjunctiva assumes a fleshy and blood appearance; and the cornea becomes opaque, not partially, but throughout the whole extent of its structure. This affection, says Dr. Vetch, is essentially different from those catarrhs or partial opacities which take place in primary sclerotic inflammation, and which consist in slight extravasations, accompanied by inflammation of light, and it is only very seldom that the purulent exudate is a necessary result of a primary inflammation. The cornea is of the green color presented by a broken glass pane, and while the sufficiently opaque cornea prevents the perception of light, it is just too opaque to allow the patient to discern external objects, except by their shadow. Nor can the outline of the iris and pupil of the eye be seen. Dr. Vetch also describes the conjunctiva as being sometimes so much relaxed, and its vessels so generally loaded, as to give it a fleshy appearance similar to that of the cornea; and, in other instances, without such alteration of its thickness or transparency, it is said to lose for a considerable extent its close adhesion to the marginal lamina of the eyelid. Along with the opaque state of the cornea, there is there generally an enlargement of several vessels, which produce almost to its centre, a disease as they were extrinsic, and separate in itself, which run to the disfigurement of the conjunctiva. Dr. Vetch represents the disease of the pupil as consisting at first in a highly villosity state of their membranous lining. This again, if not rectified by proper treatment, gives birth to granulations, which at first become more deeply situated, hard, or warty, accompanied by an itching or prurient matter. Dr. Vetch has explained, that the loss of the actual history, pressure, and friction, for the purpose of curing the diseased state of the eyelids, may be forced back in *desmops*, who prefers incisions. Dr. Vetch mentions his first employment in these cases to Dr. Ross. Mr. Saunders, he observes, took as early and a just view of the relations existing between the diseased condition of the palpebral fissure, and the opaque state of the iris; and he succeeded in establishing the cure of the latter by the removal of the former. In short, Dr. Vetch admits, that in the case which more especially served the aims of Mr. Saunders is the discovery of the nature of the disease, the practice of incisions was attended with complete success. Dr. Vetch contends, however, that this method is far the most part inadequate to the cure of the disease; and that there are very few cases, in which the more certain and constant process of gradually increasing the diseased surface by caustotic incisions will not produce a more speedy and permanent cure. After giving a fair and a plain variety of estimation made into certainty, and applied to the hands of the upper eyelid, Dr. Vetch found the direct application of the caustotic substances themselves was preferable. When there is too much increased action of the vessels of the conjunctiva, Dr. Vetch recommends the use of medicines to be provided by cupping the temples; or, when there is any risk of a slough, the application of a leech to the inside of the lower eyelid. Whatever will bring a determination of blood to the face is to be avoided, and a low regimen observed.

The exhortations, performed by Dr. Vach, are the outcome of deeper and truer faith, as, so called, the officers of peace and brotherly agreement. In his view, Dr. Vachya, they should be applied, not, as some have conceived, with the view of producing a wedge over the table together, but with great delivery, and in so many instances, as well produce a greater change in the minds, and disposition of the party. As long as there is one

secretion of tears, the above applications may be intelligibly assumed by the daily use of the opacified liquor glysteria extracta. When the disease remains these remedies, and its surface is hard and watery, Dr. Vetch applies to the corneal surface powder of verdigris or burnt alum, finely levigated, or even slightly touches the diseased lamellæ with the ball pen, in employing these remedies, he assumes removing their application to the point of contact, so as to prevent them from hurting the eye. Hence, they are to be applied in very minute quantities with a fine camel's hair pencil, and to be washed off with an elastic gum syringe, before the eye is returned. Of the employment of antiseptic collaria in conjunction with escharotics, Dr. Vetch disapproves.—(*Second Practical Treatise on the Diseases of the Eye*, p. 51, &c.). With respect to the treatment by escharotics, advised by Mr. Bealhouse with success, and afterwards by Mr. W. Adams with a knife, the principle of cure does not appear to me different from that aimed at with escharotics, unless those latter be supposed not always to destroy, but sometimes to cause an absorption of the fungus granulations. At present, the last method is considered most effectual, and during the operation the eyelids should be covered over a piece.

For the form of disease termed by Mr. Traverses—*aponeurotic*, with vessels protruding on the cornea, the prognosis is somewhat painful. He says, that "the hydropsyema (can corneæ or oedema), at small but frequent doses, will sometimes succeed better in this case, than the other forms of escharotics, and the combination of calomel with mercury, better than that with opium." When the internal exudation of mercury either destroys the lamellæ or has no effect on the cornea, blisters are to be performed.—(*Synopsis of the Diseases of the Eye*, p. 255.) In the particular form of opacity, to which he alludes, he disapproves of dividing the vessels of the lamellæ before the inflammation has subsided.—(p. 253.)

From some observations pronounced by Mr. Wardrop, it would appear, that certain quantities of the cornea are produced by an increase in the quantity of the contents of the eyeball, and not by the deposition of an extraneous fluid in the texture of the cornea, as takes place in the cataract opacities. He considers this fact proved, by cases in which the cornea regains its transparency the instant the aqueous humor was evacuated. Some cases are limited by this gentleman, with the view of recommending the practice of paracentesis corneæ, and discharging the aqueous humor, for the relief of the kind of opacity to which we have here alluded.—(*See Med. Clin. Transact.*, &c. p. 293, &c.)

For other opacity of the cornea, refer to *cataract*, *leucoma*, and *ophthalmia*.

ULCERS OF THE CORNEA.

An ulcer is a common consequence of the burning of a small abscess, which not infrequently forms beneath the delicate layer of the conjunctiva continued over the cornea, or in the very substance of the cornea itself, after violent ophthalmia. At other times, the ulcer is produced by the contact of caustic matter, or sharp pointed bodies introduced into the eye, such as metallic pieces of glass or iron, &c. As Dr. Vetch has observed, liberation of the cornea is a very frequent consequence of purulent ophthalmia. The little abscess of the cornea is attended with the same symptoms as the severe acute ophthalmia, especially with a troublesome sensation of burning at the eye, itching, and pain of the eye, with actual heat; a copious secretion of tears; aversion to light; a severe pain of the conjunctiva, particularly near the point of suppuration. The inflammatory process, compared with similar ones in any other part of the body, is more or less burning after matter is formed. Scarpa always it imagines, however, to produce the small abscess; for, though it assumes the appearance of being perfectly unattended, the matter contained in it is so tremendous and effusive to the substance of the cornea, that not a particle escapes out of the little abscess, and the second suppuration of the abscess, increases the opacity of the cornea, and often occasions another small abscess to form in the vicinity of the first. Indeed, if the observations of Mr. Traverses be correct, "the ulcer of the cornea, being not an abscess, but to a considerable degree of depth, is in pure inflammatory action."—(*Practical Treatise on the Diseases of the Eye*, p. 56.)

And Dr. Vetch takes notice, that the observation with respect to their matter never forming in the cornea, be invariably found true in several cases, where the whole of the eyeball had been diseased, where the whole of the eyeball had been diseased by inflammation.—(*Practical Treatise on the Diseases of the Eye*, p. 56.) This author differs from Scarpa, however, respecting the question of opening granules at abscesses of the cornea; for he remarks, that whenever the matter at depth is removed, the ulcer, however deep and extensive, will fill the vacant lamellæ being the consequence. If a little address, he says, it may in most instances be removed in a mass upon the point of a lancet or scalpel, &c.—(p. 56, p. 58.) This remark applies well to cases where lymph or mucous matter runs or less penetrates, and to instances in which it is quite confined between the lamellæ of the cornea. Scarpa thinks that the safest plan is to temper, and the possible spontaneously breaks, preventing it by means of frequent compresses, bathing the eye with warm milk and water, and applying constant pressure. The spontaneous bursting of the little abscess is usually denoted by a sudden increase of all the symptoms of ophthalmia; particularly by an insupportable burning pain at the point of the cornea, where the abscess first began, greatly increased by means of the eye eyelid. The event is confirmed by seeing the spot, and at the spot where the white matter appeared a cavity appears, as may best be seen when the eye is viewed in the profile. Extraneous bodies in the eye, which have simply divided a part of the cornea, or lodged in it, when soon extracted do not in general cause ulceration, as the injured part heals by the first intention. Those which destroy or burn the entire of the membrane, or which, when lodged, are not soon extracted, excite acute ophthalmia, suppuration in the injured part, and at length ulceration.

As Dr. Vetch has observed, the appearance of inflammation varies according to the degree of suppuration, or tendency towards it is the surrounding cornea; when this part is clear, the case is doing well, but when opacity comes to, the ulcer is increasing. The soft middle lamellæ, he says, is destroyed with great rapidity when the inflammation is violent, but as soon as the ulcer reaches the internal coat, it often proceeds no farther.—(*Practical Treatise on Diseases of the Eye*, p. 58.)

The ulcer of the cornea, as Scarpa remarks, has the appearance with all symptoms of ordinary in the skin, where this is delicate, tense, and endowed with exquisite sensibility, that at its first appearance, it is of a pale red color; that its edges lift and irregular; creates sharp pain; discharges, instead of pus at first water, and tends to spread widely and deeply. Such is the peculiar character of laceration upon the cornea, and such is the nature of those upon the tip of the tongue, the tip of the ear, the entrance of the meatus auditorius externus; nostrils, &c. Ulcers of this description, composed of ill-treated, speedily enlarge, make their way deeply, and destroy the parts in which they are situated. If they spread superficially upon the cornea, the transparency of the membrane is destroyed; if they proceed deeply and penetrate the anterior chamber of the aqueous humor, this fluid escapes, and a fungus of the human eye exists; and if it should form a larger opening in it, because the exit of the aqueous humor is so much more grievous probably than the above risk, namely, a prolapsus of a portion of the iris; an escape of the crystalline lens into the vitreous humor; in short, a total destruction of the whole organ of sight. It is therefore of the highest importance, as soon as an ulcer appears upon the cornea, to impede its growing larger as much as the nature of it will permit; the painful process should be converted into a healing one, and the surgeon must soon be skillful with more intention, the more sensitively and deeply the ulceration has penetrated. According to Scarpa, the contents of a single ulcer impairs the texture of the cornea so much, that the rest is irreparable. Yet Dr. Vetch asserts, that when a slight covers an ulcer of considerable extent, and is taken off with great caution, so as not to wound the inner parts of the cornea; or when it cannot be removed, if it is slightly washed and dressed, the vision may recover its transparency after two months of time has elapsed.—(*Practical Treatise on Diseases of the Eye*, p. 51.)

That who tampered with the external application can be adopted with benefit for the cure of this disease, before the semi-opthalmia has been reached, or at least diminished; say, it become the opinion, discussed. Experience teaches that local remedies ought, in the very first instance, to be applied to the ulcer; such as are the most efficacious to lessen the increased morbid irritability and stop the destructive process going on; afterwards rest must be taken as well as the opthalmia if it does not subside gradually, as the ulcer heals. It is a fact, confirmed by repeated observation, that it is the state which keeps up the morbidity, not the opthalmia the ulcer. The case, however, is to be excepted in which the liver surface is exposed in the height of a severe opthalmia. Here the first indication is to diminish inflammation before attempting to heal the ulcer.

It is true, that when the little vessels of the retina bleed, the symptoms of acute opthalmia are aggravated; the tendons of the conjunctiva are increased, as well as the purgative state of the vessels; but it is equally certain, that it happens from no other cause than an increased inflammation in the part; in consequence of the increased sensibility in the ulcerated spot of the cornea. As soon as this increase of sensibility is the ulcer of the cornea ceases or changes its violence, the opthalmia ceases with equal speed; and finally, when the ulcer heals, the inflammation disappears gradually, or, at most, requires only the use of an astringent and antiseptic collyria for a few days. Analogous examples every day occur in practice, in ulcers of other parts besides the cornea; particularly in little flat ulcers on the skin of the legs on the apex of the tongue, on the eyelids, on the glans penis, which, as was demonstrated above, at their first appearance assume an uncontained nature, while inflammation of the part is such that they are washed and cauterized very troublesome itching and indeed lead to the part affected. To subside this inflammation we do nothing more, and the vesicular state, that rapid the excessive irritability in these ulcers, and covering the ulcerative process into cicatrization; thus does the increasing inflammation immediately disappear of itself.

Such rapid and good effects may be obtained by cautery. It immediately destroys the vessels exposed out of the border in the ulcerated part, and thus removes the diseased irritability in the part affected; it converts the uncontained surface of the ulcer, and the vesicular discharge upon it, into an indurated and scab, which, as a kind of epidermis, protects the cornea or the neighboring parts upon the ulcer, and it finally changes the process of ulceration into that of granulation and cicatrization.

For converting the ulcer of the cornea, the cautery of which Scarpia gives the preference is the argentea nitrativa. It must be applied to a point, like a crown pencil, and the eyelids being opened perfectly, and the upper eyelid supported by means of Feltz's elevator, the ulcer of the cornea is so to be touched with the spec sufficiently to form an incision. Should any of the cautery descend at the tears, the eye must be copiously washed with warm milk. At the instant the cautery is applied, the patient complains of a most acute pain, but this aggravation is simply compensated by the cure experienced a few minutes after the operation: the patient lies in the eye comes, as it were, to a crust; the eye and eyelids become capable of motion without pain; the flow of tears and the discharge on the wounds of the conjunctiva ceases; the patient can bear a moderate light, and enjoys repose. These advantages last while the incision adheres to the cornea.

On the separation of the scab, sometimes at the end of two, three, or four days after the application of the cautery, the primary symptoms of the disease recur, especially the smarting and burning pain at the ulcerated part of the cornea; the effusion of tears; the return of moving the eye and eyelids; and the aversion to light; but all these inconveniences are soon as diminished before. At their recurrence the cautery, without delay, must remove the symptoms of the ulcerative process, making a good pocket, as it has, upon the whole surface of the ulcer, which, as before, is followed by perfect cure in the eye. The application of this cautery is, if required, to be applied a third time; that is, if, upon the separation of the scab, the extreme irritability in the ulcer is not diminished, and the patient cannot be cured. When the case goes on, sometimes, a great morbid phenomenon in the course

of this disease, that at every separation of the scab, the diseased sensibility of the eye is increased, the liver also becoming its pale red color, assumes a ruddy tinge, first; that, a certain sign that the destructive process which prevailed is turned into a healing one. The morbid state of the vessels of the conjunctiva, and the degree of opthalmia, disappears in proportion as the ulcer draws near to a cure. At this epoch, when the separation of granulations has begun, the surgeon would not very roughly wipe the cornea to remove the use of the argentea nitrativa; it would now produce pain, effusion of tears, and inflammation of the eye; and the ulcer would take on that red, ulcerated aspect, with swollen and irregular edges, which it had at the beginning. Parry has noticed this fact. *Nyctopia* or, at *hæmorrhoides* means, no disorder, flat, no more inflammation, *Scarpia* *hæmorrhoides* *hæmorrhoides* *collyria*.—(Hist. Chirurg. 204.) As soon as the eye is flat in the eye, and granulations begin to rise, whether after the first, second, or third application of the cautery, the surgeon must refrain from the use of every strong caustic, and use only the following collyrium: R. Zinci sulphatis gr. vi. Aq. rose. ℥iij. M. It is to be used every two hours, the eye in the intervals being defended from the air and light by means of opaque glasses and relative bandages. When, besides the ulcer of the cornea, a slight relaxation of the conjunctiva remains, Jaxar's cautery, towards the end of the treatment, introduced between the eye and eyelids, morning and evening, proved successful. It must be adapted to strength and quantity in the particular sensibility of the patient.

To cure those superficial excoriations of the cornea which make an exception in the substance of this membrane, and which, in reality, are only a detachment of the surface, covering the layers of the conjunctiva, first contact with the cautery, the use of caustic is not requisite. The same collyrium, combined with antiseptic, is sufficient. The symptoms which necessarily these slight excoriations or detachments of the cornea are transitory, and when the patient takes care to bathe his eye every two or three hours with the solution of sulphate of zinc, and to avoid too much light and exposure to heat, they soon get well.

According to Dr. Vesali, when the ulcerative process is a body to destroy the membrane which lines the cornea, it can only be checked by measures calculated to subside the inflammation upon which it depends. "As long, therefore, as there is an appearance of activity in the disease, or recurrence of pain, heat, blood-letting by cupping or leeches must be steadily suffered to. The indication of the ulcer being is easily seen in the diminished activity of the inflammation, relief from pain, and the ruddy aspect of the ulcerated part. The application of vegetable, liquid, astringent, balsamic may be used, as such and water only. When called upon in chronic cases, where the incessant perforation of the cornea has been threatened, we test, with great propriety, resort to the operation of penetrating the cornea at a place as remote as possible from the ulcer. Next in importance is a diminution of the action on which the ulcer depends, is the removal by excision of any sloughs formed out from its surface, or detached in the adjoining part of the cornea. Sometimes, but always unnecessary in these indications, we may add some topical applications to the ulcer; a solution of nitrate of silver, the infusion of tobacco or calabar in powder, applied with a soft hair pencil."—(Practical Treatise on Diseases of the Eye, p. 57.) In chronic perforation of the cornea, the membrane of the cornea, this author decidedly condemns the use of the argentea nitrativa in the first manner proposed by Scarpia, observing that, "if the cautery touches by accident the edge of the ulcer, or any part but the apex of the projecting scab, it will soon produce such mischief."

Thus far of ulcers of the cornea, and the best method of curing them is ordinary cautery. However, sometimes, says Scarpia, in consequence of disarrangement, the liver, already very extensive, contains the form of a fungus exuberant upon the cornea, appearing to detain its nourishment from a kind of blood-vessels of the conjunctiva; and on this account it consumes, but independently, a serious remedy is being taken for a bad phlegm. Left to itself, or treated with slight astringents, it produces, in general, a loss of the white eye. It requires the speedy applica-

CUPRI SULPHAS (Sulphate of Copper) is an astringent, and an ingredient in several astringent fluid applications, known for its use, polyptia for the eye, and leucorrhoea for the uterus.

CURETTE (French). An instrument shaped like a female spoon or scoop, provided by the柄, and used in the extraction of the uterus, for taking away any organic matter, which may remain behind the vagina immediately after the lochia has been taken out.

CURVATURE OF THE SPINE. See *Frederick, Disease of*.

DACRYOMA. (From *dacryon*, to weep.) An inflammatory state of one or both the puncta lacrymalia, preventing the tears from passing by their ordinary exit.

DECOCTUM CHAMOMELLÆ. R. Florum chamomellæ, ʒss. Aquæ destillatæ, ℥j. Boil ten minutes, and strain the liquor. A common decoction for febrile affections. (See *Formulations*.)

DECOCTUM PULCARRÆ. R. Infusuræ radicis corneæ rosarum, aquæ destillatæ citæ semion. Decoqui ad octiduum, q̄libet.

The decoction of lichenwood, or woody nightshade, is recommended for some catarrhs of the uterus, proceeding from scrophulous, leucorrhœa, and leucorrhœa. The dose is one or two table spoonfuls, three times a day. An astringent decoction should be added.

DECOCTUM BELLEROPHORI ACID. (Now the Decoction of Turpentine.) R. Pulveris radicis bellerophori, ʒss. Aquæ destillatæ, ℥j. Saturas vases rectificatis, ʒij. Boil the water and powder till only one-half the fluid remains, and when cold add the acid.

This is used as a lotion for curing pueri, porrigo, and some leucorrhœa affections.

DECOCTUM LABELLÆ. (Now Cardiall Flower of Turpentine.) R. Radicis lichenis hyssopifloræ, ʒss. Aquæ destillatæ, ℥ij. This is to be boiled till only four parts remain. The lichenaceous growths resemble an aspidioid, though little plants in appearance. The patient is at first to take half a glass twice, and afterwards four times a day. It operates, however, as a purgative, and the doses must be regulated according as the bowels appear to bear them.

DECOCTUM MARGERITÆ. R. Cerasi medicæ, rosarum, recetis, ʒj. Radicis glycyrrhizæ, coarsius, ʒj. Aquæ destillatæ, ℥ij. Boil the mixture in the water till only two parts remain; and when the boiling is nearly finished, add the lichen root.

The decoction of rosemary has been much prescribed for venereal sores and nocturnal pains in the bones, in doses of three four to eight ounces, three times a day.

DECOCTUM PAPAVERTIS. R. Papaveris mariani capsularum coarsius, ʒss. Aquæ, ℥ij. Boil for a quarter of an hour, and strain. The decoction is used as a sedative fluid.

DECOCTUM QUEBECUR. R. Quercus cortex, ʒj. Aquæ, ℥ij. Boil down to a pint, and strain the fluid.

This decoction forms a very astringent mixture, which is sometimes used for stopping fluxes from the vagina. It also makes a lotion which is of considerable use in curing priapisms, &c. It may be applied to the eye after moderate waste medicine, which it will accumulate there, particularly when a little strain is put upon it.

DECOCTUM SARRAPILLÆ. R. Sarrapillæ radicis coarsius, ʒss. Aquæ destillatæ, ℥ij. The sarrapilla is to be macerated in the first liquor, four days, in a vessel lightly closed. The rose is then to be taken out, bruised, and put into the fluid again. The decoction is to be continued two hours longer, after which the liquor is to be boiled till only two parts remain. Lastly it is to be strained.

DECOCTUM SARRAPILLÆ COMPOSITUM. R. Rosæ, sarrapillæ, hyssopifloræ, ʒss. Mucosæ rosarum coarsius, gutturæ ligulæ, ʒss. glycyrrhizæ radicis recetis, ʒss. Aquæ, ℥ij. Mixture rosarum coarsius, ʒij.

These are to be boiled together the quarter of an hour, and then strained.

Two and the preceding decoction of sarrapilla are much prescribed in cases of venereal sores and pains,

CUPPING. See *Bleeding*.

CYSTOSTOME. (From *cystis*, and *stoma*, to eat.) An instrument made on the same principle as the lithotome, and inserted by the duct of the bladder, for opening the capsule of the crystalline lens.

CYSTOCÆLE. (From *cystis*, the bladder, and *cæle*, a tumor.) A tumor formed by a protrusion of the bladder. (See *Hæmorrhoids*.)

CYSTOTOMIA. (From *cystis*, the bladder, and *tomia*, to cut.) The operation of opening the bladder, for the extraction of a stone or calculus. (See *Lithotomy*.)

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but while some surgeons hold that it is high time to such cases, others extend it to almost all cases of them. They are also occasionally given in several rheumatic diseases, and to scrophula.

The simple decoction is frequently directed for the restoration of the constitution after a severe disease, sometimes mixed with an equal quantity of port.

The common dose of both the decoctions is from six to eight ounces, three times a day.

The compound eye-pain decoction is the proper medicine of the famous Lisbon diet table, for which it serves a valuable substitute.

DECOCTUM ULMI. R. Ulmi coarsius, ʒss. Aquæ, ℥ij. Boil to two parts, and then strain the liquor.

The decoction of elm bark is often prescribed to women in dysmenorrhœa. Its operation is frequently promoted by giving with it the hydrocyanic solution.

DECOCTUM VERATRÆ. See *Decoction of Veratrum*.

DEPRESSION OF THE SKULL. See *Head*, to *press*.

DEPRESSION OF THE CATARACT. See *Cataract*.

DETERMINATION. When the mind turns itself more rapidly and frequently than is usual, it is said, in the language of surgery, that there is a determination of blood to it.

DIARRHŒA. (From *diarrhoia*, to drip.) A flux of substance; a secretion of continuity. This may be a sort of gastric term, applied to every part of the body, by which the secretory organs are disturbed.

DIGESTION. (From *digestis*, to digest.) By the digestion of a material, or other, one of its parts is broken down to a state in which it is dissolved bodily.

DIGESTIVES. Applications which produce this effect.

DIPHTHOSSIS. (From *diphthosis*, to draw.) One of the ancient divisions of surgery; it signifies the drawing of parts to their proper situation.

DIPLOPIA. (From *diploia*, double, and *opsis*, the eye, or *oculus*, to see.) This diplopia is of two kinds. The ordinary, the patient either sees an object double, triple, &c. only when he is looking at it with both his eyes, and he never is the first time that the object is seen single and right; or else he sees every object double, whether he surveys it with one or both his eyes. The disorder is observed in almost all degrees of weakness. Patients seldom see the two appearances which objects present with equal distinctness; but generally discern one much more plainly and distinctly than the other. The first distinct image which strikes the eye is commonly that of the real object, while the second is indistinct, false, and imaginary. Therefore patients observing under this affection seldom make a mistake, but almost always were when under this and real object. However, there are cases in which the patient sees, with equal distinctness, the two appearances which thus he observes, so that he is incapable of distinguishing the real object from what is false and only imaginary.

The disorder is sometimes transitory and of short duration, and may be brought on in a healthy eye by some accidental cause, generally an irritation affecting the organ. Sometimes the complaint is chronic, sometimes permanent. In particular instances the patient sees objects double, when he has been straining his sight for a considerable time, as, for example, when he has been reading a small print for a long while by the

the style. In this case, the disorder becomes accentuated by starting the eyes for a few moments. There are also instances in which the objects have a double appearance only at a particular distance, and not either when they are nearer or farther off. Sometimes the patient, when objects divide only upon one side; as, for example, when he jumps his eyes to the right-hand, while nothing of the sort is experienced in looking in any other direction. In certain cases, objects appear double, in whatever way the eyes are turned and directed.

The causes of double vision may be divided into four classes. Namely, the object upon which the patient looks at may be represented double upon the retina; which is the effect of the first class of causes. Or, the object may be depicted in one eye differently from what it is in the other, in respect to size, position, distance, clearness, &c. This is the effect of the second class of causes. Or, the object may appear to one eye to be in a different place from that which it seems to the other in respect to the effect of the third class of causes. Or, lastly, the inequality of the eyes serves as a defective, so that the image of an object, though it may appear single to one eye as well as to the other, yet in some unusual situation will seem double to both of them. When the complaint originates from causes of the first and fourth class, the patient sees things double, whether he is looking only one or both eyes; but when it proceeds from the second and third class of causes, the patient sees objects double only when he is looking at them with both eyes, and no longer does he find that these objects put on their natural single appearance.

The following are the chief causes of the first class of a single object being depicted upon the retina as if double. 1. An unevenness of the cornea, which is divided into two or more convex surfaces. There are cases, which show that such an uneven shape may actually be the cause of double vision. (Hallé, *Klinisch. Physiol.* t. 2, p. 85.) According to Beer, this unevenness of the cornea is usually a result of several preceding ulcers of the membrane, in which circumstance, the patient sees with the affected eye not merely double, but three, and even more, of objects before him, as we have examples. (Hallé, *loc. cit.*) However, it must not be supposed that in all the greater number of instances, such unevenness of the cornea, though usually considerable, does not constitute a defect of sight. We have frequently an opportunity of observing cases of this sort after the operation of extracting the cataract. Hence, it would seem that the irregularity must be of very particular shape to produce double vision. The diagnosis of this cause is easy enough, but the removal of it is impracticable; for here it is possible to restore the original shape of the cornea! On this issue, however, Beer delivers a more favorable prognosis than Richter; for he states that when the patient is not deceived, the double vision, from uneven shape of the cornea, will gradually disappear of itself, when proper care is taken of the inflammation, and is particular of the eye. (R. 3, p. 22.) 2. An irregularity of the surface of the crystalline lens, whereby the same is divided into several distinct surfaces, it is supposed, may also be the occasion of diplopia. Such an irregularity may possibly produce the disorder; but it is exceedingly doubtful whether any case of this sort has ever been met with, and, as Richter ingeniously remarks, the investigation is not worth undertaking, as the diagnosis and cure would be equally impracticable. The only possible method of removing the irregularity is by operation of the crystalline lens; yet with the uncertainty respecting the nature of the case, what need would be justified in performing an operation, in which the patient runs wholly unaverted from the danger of losing the sight altogether? A double aperture in the iris, or, as the case is termed, a double pupil, and a division of the pupil from its axis of insertion, have been ascertained as causes of diplopia. (Hallé, *loc. cit.*) See also, *loc. cit.* t. 1, p. 85. 3. However, Richter denies the reality of the first of these causes altogether; he says he has never noticed, where double vision exists, but the effect of these being two apertures in the iris. (Ueber, *How*, *var.* (1822.) But when the disorder actually is produced in this way, the experiment might be made of stopping the two apertures with wax.

The causes of the second class, by the effect of which the object is represented, in respect to its size, position, distance, &c., differently in one eye from what

it is in the other, are for the most part rather possible, than such to have been actually observed. The causes which make objects appear as if appeared contrary to the real case, may sometimes be confined to one eye, so that things are depicted differently from what they are to the other healthy eye, by the patient seeing, as it were, double. Thus, for example, there may be a stronger refraction of the rays of light in one eye than the other; the patient may be a myope with one eye, and a presbyope with the other; and then the object will seem in one eye large, in the other small; to one eye distant, in the other nearly so. The strain of the sight, indeed, is said to have occurred after opening upon a distant object eye. (Huttenlocher.) However, that this is not a constant consequence of opening upon a distant object in one eye, while the other is perfect, is sufficiently clear from what has been said upon this subject in a foregoing part of this work. (See Cataract.) In particular examples, objects which are perceptible as if seen to the patient to have a sloping position. When this is considered that only one eye is thus affected, and that in all things will appear straight, and in the other straight, double vision must be the effect. A few remarks connected with this subject will be mentioned hereafter. (See Sight, Defects of.)

When both eyes are so diseased in an extent, that it becomes situated in the axis of vision of each of these organs, such object is represented in both at the same place, that is, it is depicted upon that part of the retina on which demand sight falls. Thus the object seems to both eyes to be in the same place; and though the two unequal distort the thing, it only represents a single appearance. But when one eye is turned in any object in a different direction from that of the other; that is to say, when one eye is turned as an object in such a way that the object is situated in the axis of vision of this eye, while the opposite eye is so turned that the same object is placed on one side of its axis of vision; in other words, when a person squints, the object is depicted in one eye upon a different part of the retina from what it is in the other; consequently, the object appears to the two opposite organs to be differently situated, and the patient is affected with diplopia. This is the third species of this disorder, which arises from strabismus, as a third kind of unequal causes. Such patients naturally see objects double only when they looked them with both eyes. A lady, whose I frequently see, is much annoyed with diplopia; the effect of depressed vision in the orbit, whereby the eye is forced out of its natural position.

A person who suffers usually has one eye stronger than the other, and the weakness of one of these organs is the common cause of the strabismus. Such a person does not see objects double, located, he only sees with one eye well, and with the other so faintly and imperfectly, that scarcely any impression is made. Hence, every case of strabismus is not necessarily combined with diplopia; indeed, the common kind of squinting is not joined with it. A person affected with strabismus only, does double when the sight of each eye is equally strong, and when the squinting does not depend upon any weakness of one of the eyes, but upon some other occasional causes. The principal causes of the latter sort are of a spasmodic nature, viz. an irritation affects some muscle of the eye in such a manner, that the patient is transported from moving both his eyes according to his will, and from directing them to any object, so that each object may be in a place in the axis of vision of both. On this point, the observations of Sir E. Home are interesting, who has made many accurate collections on the effect of an irregular action of the straight muscles of the eye in producing double vision. (Phil. Trans. 1787.)

Richter states that in the majority of cases, the irritation alluded to is seated in the rectus externus, though he thinks that any other species of irritation may operate upon the eye in a similar manner. This kind of diplopia is frequently attended, on other spasmodic diseases as a symptom. It often accompanies ophthalmia. Sometimes it is the consequence of violent pain. Richter informs us of a man who saw double, and squinted, during a severe headache. He states that he was affected in the same way during a toothache. Sometimes the diplopia is owing to a paralysis of one of the muscles of the eye (Huttenlocher, de Oculorum et Aurium Morborum, quod. 12, art. 26, a pure loss of the conductor muscle?) sometimes to a tension in

few which require two precise positions, or in which the position of the support is more or less stable, therefore of location; by which time he has paid to the student at dislocation, there is great additional difficulty in accomplishing it, and it is often entirely incapable of being effected. If it remains unknown, and consequently uncorrected, the patient becomes a living memorial of the surgeon's ignorance or inattention. Hence this experienced surgeon forcibly admonishes the careful study of anatomy; the want of accurate knowledge of the structure of the joints being the chief cause of the many errors which happen in the diagnosis and treatment of dislocated bones. The following passage cannot be too deeply impressed upon the surgeon's mind: "A considerable amount of anatomical knowledge is required to detect the nature of these accidents, as well as to suggest the best means of reduction; and it is worth to be lamented, that our students neglect to learn themselves sufficiently of the structure of the joints. They often discuss the subject of a limb with great freedom and animation, and then deliver a report, without any examination of the ligaments, the knowledge of which, in a surgical point of view, is of infinitely greater importance; and even learn some of the numerous errors of which they are guilty, when they embark in the practice of their profession; for the injuries of the hip, elbow, and shoulder are scarcely to be detected but by those who possess accurate anatomical information. Even our hospital surgeons, who have neglected anatomy, mistake these conditions; for I have known the pulleys applied to an injured patient in a case of a fracture of the neck of the thigh-bone, which had been mistaken for a dislocation, and the patient cruelly exposed, through the surgeon's ignorance, to a violent and protracted extension. It is therefore proper, that the form of the ends of the bones, their mode of articulation, the ligaments by which they are connected, and the direction in which the larger tendons, should be well understood."—(*Surgical Essays*, part I, p. 3.)

The most important differences of location are: 1. With respect to the direction in which these accidents take place; 2. The extent of the dislocation; 3. The direction in which the bone is displaced; 4. The length of time the displacement has continued; 5. The circumstances which accompany it, and which make the injury simple or compound; 6. And lastly, with respect to the causes of the accident.

1. Every kind of joint is not equally liable to dislocations. Experience proves, indeed, that in the greater part of the vertebral column, location is not admissibly impossible; the pieces of bone being united by extensive articular surfaces, deeply, in their form and direction, and so tied together by many powerful elastic vessels, that very little motion is allowed. Experience proves also, that the strength of the articulations of the pelvic bones can scarcely be affected by morbid efforts, unless these bones be simultaneously fractured. Never has therefore set down a location of joints with continuous surfaces as impossible.—(*Treatise on Medico-Legal Science*, § 4, p. 17.) And Sir A. Cooper observes, and in the end, the union between any two bones is so solid, that dislocations hardly ever occur, except between the femur and osseous vertebra, although the bones are often displaced by fracture.—(*Surgical Essays*, p. 11.)

In the articulations with contiguous surfaces, the facility with which dislocations happen, depends upon the extent and variety of motion in such joints. Thus in the elbow joint of the upper, and particularly at the tarsal, and at the carpal and basal extremities of the metacarpal and metatarsal bones, where flat broad surfaces are held together by ligaments, strong, numerous, and partly interarticular, and where only an obscure degree of motion can take place, dislocations are very difficult, and can only be produced by uncommon violence.

The loose joints, which admit of motion in every direction, are those in which dislocations most frequently occur, such is that of the humerus with the scapula. On the contrary, the glenoid joint, which allows motion only in two directions, two, comparatively speaking, seldom dislocated. The anterior articulation of the larynx is of great extent, and consequently the heads of the bones must be pushed a great way in order to be completely dislocated; and the ligaments are numerous and strong.

2. With respect to the extent of the dislocation, locations are either complete or incomplete. The latter term is applied, when the articular surfaces still remain partially in contact. Incomplete dislocations only occur in ginglymo-articulations, as those of the knee, knee, and elbow. In these, the function is almost always incomplete; and very great violence must have operated, when the bones are completely dislocated. In the elbow, the dislocation is partial, with respect both to the ulna and radius. In the oblique articulations, the humerus are almost invariably complete. However, "like or almost sometimes runs upon the edge of the glenoid cavity, and readily returns into its socket."—(*Cooper's Essays*, part I, p. 14.) The lower jaw is sometimes partially dislocated in a manner different from what is commonly meant by this expression, viz. one of its condyles is jammed, while the other remains in its natural situation.

As Sir A. Cooper has explained, a partial dislocation sometimes occurs at the ankle-joint. "An ankle says he, was dislocated at Guy's, and given to the collection of St. Thomas, which was partially dislocated; the end of the tibia rested still in part upon the astragalus, but a large portion of its surface was united on the os navicularis, and the ilia, altered by this change of place, had formed two new articular surfaces, with their faces turned in opposite directions towards the two bones. The dislocation had not been reduced."

3. In the extremity joints, the head of the bone may be dislocated at any point of their circumference; and the locations are named accordingly upwards, downwards, forwards, and backwards. In the ginglymo-articulations, the bones may be dislocated either laterally, or forwards, or backwards.

4. The length of time a dislocation has existed makes a material difference. In general, recent dislocations may be easily reduced; but when the head of a bone has been out of its place several days, the reduction becomes exceedingly difficult, and in older cases very often impossible. The soft parts and the bone itself have acquired a certain position; the muscles have adapted themselves in length to the altered situation of the bone in which they are attached, and sometimes cannot be lengthened sufficiently for it to be reduced. Indeed, I believe that Sir Astley Cooper's statement is quite correct, that the difficulty in the reduction, arising from the muscles, is proportioned to the length of time that has elapsed since the period of the accident.—(*Treatise on Dislocations*, p. 25.)

Dewees and Boyer believe, that frequently the opening in the capsule ligament soon becomes closed, and hinders the return of the head of the bone into its original situation. However, with regard to the doctrine of the solution being prevented by the capsule ligaments, it is considered by Sir Astley Cooper as groundless or foundation.—(*Surgical Essays*, part I, p. 15, and *Treatise*, &c. p. 25.) Lastly, the head of the bone may become adherent to the parts on which it has been forced.

5. The difference is likewise, in regard to the danger of the case, arising from the extensiveness of a dislocation being attended or unattended with a wound, communicating internally with the joint, and externally with the air. When there is no wound of this kind, the danger is generally trivial, and the dislocation is termed a simple one; when there is such a wound, together with the dislocation, the case is demonstrated compound, and is frequently accompanied with the most imminent peril. Indeed, the latter kind of accident sometimes renders amputation necessary, and in one many instances has a fatal termination.

6. The causes of dislocations are external and internal. A predisposing to such accidents may depend on circumstances internal or external. The great latitude of motion which the joint admits of, the little extent of the articular surfaces; the looseness and division of the ligaments; the looseness of one side of the articular cavity, as of the anterior and inferior part of the acetabulum; and the shallowness of the cavity, as of that of the scapula; are natural predisposing causes of locations.

A partial effect of the removal of a joint, such as a loosening of its ligaments, are also predisposing causes. When the deltoid muscle has been paralytic, the new-weight of the arm has been known to cause such a lengthening of the superior ligament of the shoulder.

ment, and which is adherent to the bone. Thus, in dislocation of the thigh, the bone and ligament turned outwards or inwards, according as the head of the thigh-bone happens to be situated at the inside or outside of the joint. These positions of dislocation in the limbs are of the limbs are permanent, when they depend upon a dislocation; a dislocation admits of several dislocations, and is observable in dislocations, when the same ligament occurs, but can be made to come at once, without any particular effort.

3. The absolute necessity of a limb, or, at least, the facility of performing certain motions, is among the most characteristic symptoms of a dislocation. In some complete fractures of humeral epiphysal joints, the dislocated part is insensibly, or very easily, movable in all motions. Thus, in the dislocation of the osseous humerus, the peculiar disposition of the bone, and the extreme tension of the extensor and flexor muscles, enable the limb in the half-bent state, and at the same time resist every spontaneous motion, and likewise almost every motion which is communicated. In the osseous joints, the partial motion of the osseous which surround the bony bone, being supported by epiphysal membranes; but, in general, symptoms of motion, that by which the dislocation was produced, can be communicated to the limb, though not without evoking pain. Thus, in the dislocation of the humerus upwards, the elbow kindly admits of being put over the side, or of being carried forwards and backwards; but it can be raised up with ease. In the dislocation of the osseous end of the clavicle, the patient can bring the arm towards the trunk, separate it a little from the side, or carry it forwards or backwards; but he cannot raise it in a direct way. Lastly, in complete lateral dislocations of such joints as have alternate motions, the patient has the power of performing motions of the part; but the complete destruction of all the vessels of motion allows the limb to stay every species of continuous motion; and this symptom, which is known never long, makes the nature of the case sufficiently manifest.

Continuing, at Sir A. Cooper has remarked, a considerable degree of osseous resistance for a short time after a dislocation. Thus, in a case, brought into Guy's Hospital, where the humerus had just been dislocated from the osseous end, a great mobility of the arm still remained; but, "in less than three hours, it became firmly fixed in its new situation, by the contraction of the tendons."—(Surgical Essays, part 1, p. 2.)

4. In dislocations attended with elongation of the limb, the general malformation of all the vessels arranged along it, gives to these vessels an appearance as if they lay under the circumference of the bone, and the limb were smaller than its former. The muscles, however, which belong to the side, from which the dislocated bone has become more distant, appear more tense than the others, and form externally a prominent line. This is very manifestly the case with the biceps muscle, when the arm is turned downwards. On the contrary, in dislocations where the limb is shortened, the muscles are relaxed; but, being irritated, they contract and approximate themselves to the shortened state of the limb. Hence the extraordinary swelling of the portion of the tendons to which they belong. We have a striking example of this in the dislocation of the thigh upwards and outwards, where the muscles at the head of the limb form a distinct oblong tumour.

The parts which surround the affected joint also experience alterations in their form, whether occasioned by the dislocated bone, or by the contraction of the muscles. Thus, in dislocations of the thigh, the biceps on the osseous side is enlarged, if the bone is carried upwards; but it is much more relaxed, when the thigh-bone is carried outwards; and its former edge is enlarged higher or lower than in the natural state, according as the limb may have been placed upwards or downwards. In the complete laceration of the osseous back-wards, the thumb is bent, and there is a protruded prominence, owing to the dislocation of the osseous back-wards, in which dislocation it is obliged to participate.

5. The circumstance of the joint itself presents alterations of shape, and osseous articular, and it is to judge rightly of this symptom, correct anatomical knowledge is of high importance.

The form of the joint principally depends upon the

shape of the heads of the bones. Hence, the natural relation of the bones to each other cannot be altered without a change being immediately produced in the external form of the joint. The changes which the muscles passing over the dislocated joint at the same time undergo in their situation and direction, contribute likewise to the alteration of shape, by displaying the harmony of which may be called the osseous of the limb.

When the head of a bone articulated by cartilages, has slipped out of the cavity, instead of the phalanx which previously indicated the natural position of parts, the head of the dislocated bone may be distinguished at some surrounding point of the articulation, while at the articulation itself may be remarked a tumour, caused by one of the neighbouring muscles stretched over the articular cavity, and more deeply may be perceived the outline and depression produced by the cavity itself. The bony relations around the joint, and whose outlines were possibly effaced in the general form of the member, are now made much more apparent by the displacement, and project in a stronger degree than in the natural state. On this part of the subject Sir A. Cooper is particularly correct, when he observes, that the head of the bone can generally be put in its former situation, excepting in cases of translocation of the ligament, and its position is often the best criterion of the accident. The natural prominence of the joint, the joint, either dislocated or become less conspicuous, or the tendons at the ligament, sometimes the osseous cavity, for as dislocation of the shoulder, the osseous cavity is more than usual.—(Surg. Essays, part 1, p. 4.)

The lines made by the contour of the limb and the natural relation of the bones, are so manifestly broken in dislocations of epiphysal joints, that when there is an inflammation swelling the case is more manifest. More certain knowledge, however, and more correct information respecting the kind of dislocation, are to be obtained, by attentively examining the changes of position which the bony prominences forming the articulation of the bones articulated together have undergone, and which are the more obvious in those joints, in which they give attachment to the principal muscles. The natural position of these processes being known, the least error of situation might indicate the well-informed position. Thus, in the elbow-joint, a considerable difference in the respective height, and in the distance between the osseous and internal and external condyles, can be easily distinguished. But the thing is less easy when the surrounding parts are so swollen and come as to make the bony projections deeper from the surface and less obvious to examination. Even then, however, a good surgeon will at least find something to make him suspect the dislocation, and the surgeon will be confirmed when he again examines the part after the swelling has begun to subside. It is of the utmost consequence to make out what the case is as early as possible; for the natural state in which the soft parts are placed forms the swelling along white; and if the surgeon wait till this has entirely subsided before he examines that the bones are injured, he will have waited till it is too late to think of restoring them, and the patient must remain for ever afterwards, crippled at the foot of his limb.—(Nouv. Traité des Maladies Vén. Ch. 2, § 4, c.) It is not only the osseous cavity swelling which may tend to conceal the state of the head of the bone; sometimes a quicker osseous action, from the effusion of blood in the reliable symptoms, and causes an equal difficulty of feeling the exact position of the heads of the bones.—(Nouv. Traité on Dislocation, by Sir A. Cooper, p. 6.)

Dislocations are also sometimes attended with particular symptoms, arising altogether from the pressure caused by the head of the dislocated bone on certain parts. The osseous end of the clavicle has been known to compress the trachea and impede respiration; the head of the humerus may press upon the solitary pieces of nerves, and produce a paralytic affection of the whole arm. In one instance cited by Sir A. Cooper, a dislocated clavicle pressed upon the vagus and endangered life.—(Surg. Essays, part 1, p. 4.)

As Kelland has observed, there are some dislocations which are far more frequent than fractures; of this description are dislocations of the vertebrae, crania, which, indeed, can hardly happen without fracture.

and are almost always fatal; dislocations of the long bones, with protrusion of their ends through the periosteum and skin, and severe inflammation, extensive abscesses, attended with great risk of being followed by large and tedious suppurations, and are subsequently gangrenous.

According to Sir A. Cooper, young persons are rarely subjects of dislocations from violence; but he admits that they do sometimes experience them, and relates an instance which happened in a child seven years of age. In general, their bones break, or their capsules give way, much faster than usually that the articular surfaces are displaced. (*Dict. Nocturne*, part. 8, p. 18; and *Thesaur.*, 4, p. 23.) Supposed luxations of the hip in children commonly turn out to be dislocations of the joint, one instance of which is given by the preceding author, and an example of which I was lately consulted about myself. Also when a dislocation of the elbow is expected in a child, because the bone appears ready to burst into its place, but directly to snap out of it again, the case, according to Sir A. Cooper, is an oblique fracture of the condyle of the humerus. Old persons are also much less liable to dislocations than individuals of middle age; a fact which is accounted for by the attenuation of joints in old subjects being so softened that the violence seems breaks many times them. (*Sir Astley Cooper, Thesaur.*, &c. p. 23.)

RECOVERY.

In general, every unreduced dislocation must deprive the patient more or less completely of the use of the limb; for nature cannot re-establish the natural relations which are lost. There is indeed an effort made to restore some of the motions and the use of the limb to a certain degree; but it is always very imperfectly accomplished, and in the best cases, only a partial degree of motion is recovered. Nature cannot in any way alter the lengthened or shortened state of the limbs; and she can only correct in a very imperfect manner the faulty direction. There are even some cases in which no amelioration whatsoever can be effected; as in complete dislocations of glenohumeral joints.

There are, however, a few exceptions to this general rule. The articular joints are seldom permanently displaced; and so, in the natural case, their motions are very limited, the loss of these motions is consequently of the natural motions not having been restored, is of less importance. Thus, the bones of the osseous, those of the tarsus, and the acetabulum end of the clavicle may be dislocated, and be reduced either imperfectly or not at all, without the function of the limb to which they belong being materially impaired. (*Singer, Traité des Maladies Chir.* 1, 4, p. 54.)

Dislocations of carpal joints are generally much less dangerous than those of glenohumeral ones; for the action of the muscles give a great effort in pushing the bones; the violence done to the collateral parts is less; and the insertion of the soft parts is not so considerable. Even in the same kind of joints, the seriousness of the case depends on the largeness of the articular surfaces, and the number and strength of the muscles and ligaments.

Dislocations of glenohumeral joints, however, are more easily reduced than those of carpal ones, the muscles of which are frequently very powerful, and capable of making great resistance to the efforts of the surgeon. This is frequently seen in luxations of the shoulder and wrist.

It may be said, however, of the luxations of carpal joints, that if they happen the most easily, they are attended with less injury; and that although their reduction may require considerable efforts, yet it can be accomplished, and the motion leaves no ill effects. On the contrary, in dislocations of glenohumeral joints the same pains which produce these cases are frequent, unless there are more serious. The solidity of these joints prevents the treating means from being destroyed except by great violence; and the extent of the articular surfaces does not permit a considerable displacement, especially a complete one, without extensive injury of the ligaments and surrounding soft parts. It is for these reasons, no doubt, that compound luxations and protrusions of the heads of the bones are more commonly seen in the glenohumeral articulations.

The more recent attempts to the cure may it is to

reduce, and, therefore, certain position, the less given to the injury. In this point of view, dislocations of glenohumeral joints are the most serious, because they are more become irreducible.

Simple dislocations are much less dangerous than those which are complicated with contusion, the injury of a large nerve or blood-vessel, inflammatory swelling, fracture, wound, and, especially, a protrusion of one of the articular surfaces. (*Singer, Traité des Maladies Chir.* 1, 4, p. 65, 66.)

Dislocations from violence and suppression in joints, termed spontaneous luxations, cannot admit of reduction: when they arise from the hip-joint, it is not merely in consequence of the ligaments being destroyed, the form of the acetabulum itself is often obliterated. However, there are other spontaneous dislocations from preternatural loosening of the ligaments, where reduction may be accomplished with the greatest facility; though the displacement generally results from the slightest causes.

TREATMENT OF DISLOCATIONS IN GENERAL.

Mr. Pott observes:—By what our forefathers have said on the subject of luxations, and by the descriptions and figures which they have left us of the various methods of what they call their cures and machinements, it is plain, that once upon their object, and what whatever purposes were aimed at or executed by these instruments or machines, were aimed at and executed principally by violence. Many or most of them are much more calculated to pull a man's joints asunder than to set them to rights. Hardly any of them are contrived as to restore the purpose for which they should be used, in a manner most adapted to the nature or position of the parts on which they are to operate. The force or power of some is destructive; it is not always determinable, as to degree, by the operator, and consequently may be too little or too much, according to different circumstances in disease, or more or less nature or thickness in the subject. If, in the degrees of these accidents, an exact knowledge of the symptoms is of the highest importance, a familiar acquaintance with the anatomy is not less essential in the treatment.

In dislocations, as in fractures, says Pott, our great attention ought to be paid to the muscles belonging to the part affected. These are the moving power, and by these the parts, as well as other movable parts, are put into action; while the parts to be moved are in right order and disposition, their motion will be regular and just, and generally determinable by the will of the agent (at least in what are called voluntary motions); but when the said parts are distorted from that order and disposition, the action or power of the muscles from themselves ceases; far from it, they still continue to exert themselves violently, but instead of producing regular motions at the will of the agent, they pull and distort the parts they are attached to, and which, by being displaced, cannot perform the functions for which they were designed.

Hence principally arise the trouble and difficulty which attend the reduction of luxated parts. The more bones composing the articulations, the more surrounding ligaments, would in general admit very little opposition; and the restoring the dislocation would require very little trouble or force, was it not for the resistance of the muscles and tendons stretched to and connected with them; for by examining the fresh joints of the human body, we shall find, that they are only as if moved by muscles and tendons, but also, that although what are called the ligaments of the joints are really connect and hold them together, in such manner as could not well be exceeded without harm, yet in many instances they are, when subject of all commotion, so very weak and lax, and so extensible and distensible, that they do little more than surround the bones and retain the synovia; and that the strength as well as the motion of the parts, depends on great measure on the muscles and tendons connected with and passing over them; and that in those articulations which are designed for the greatest activity, as well as for celerity of motion. Hence it must follow, that as the degree, stability, action, and strength of the principal joints depend so much more on the muscles and tendons in connection with them than on their own ligaments, that the former are the parts which require our first and greatest regard, these being the

parts which will necessarily oppose us in our attempts for reduction, and whose resistance must be either eluded or overcome; third of very different aspect, and which every practitioner ought to be well apprised of.—(See *Pott's Case*, Works, vol. 1.)

That the muscles are the chief causes of resistance is strongly evinced by cases in which the dislocation is accompanied with injury of a vital organ; for then the bone may be reduced by a very slight force. Thus, in a man who had an injury of his pyramis, and a dislocation of his hip, the bone was most easily replaced.—(See *A. Cooper, Surgical Essays*, part 1, p. 38.) In short, any thing which produces spasms or weakness facilitates the reduction, as intoxication, coma, and sickness, paralysis, &c.

The following, which are some of the principles laid down by Mr. Pott, merit attention.

1. Although a joint may have been injured by means of considerable violence, it does by no means follow that the same degree of violence is necessary for its reduction.

2. When a joint has been lacerated, at least one of the bones of which it is composed is detached in that unusual situation by the action of some of the surrounding parts in connection with it; which action, by the immobility of the joint, becomes as it were total, and is not under the direction of the will of the patient.

3. That all the force used in reducing a lacerated joint, be it more or less, be it by hands, levers, ligatures, or machines, ought always to be applied to the other extremity of the said bone, and as much as possible to that only. Mr. Pott argues, that if the extending force were applied to a detached part of the bone, or to the bone before or adjacent, it would necessarily be lost in the articulation which is not lacerated, owing to the yielding nature of the ligaments, and so of falls or as we say in that which is dislocated. This remark, though made by Pott and generally received as true, is very improper; for it tends to state that if you pull at the whole or even, the force does not operate on the hip or shoulder.

4. That in the reduction of such joints as are composed of a global head, moved into a socket, such as those of the shoulder and hip, the whole body should be kept as steady as possible.

5. That in order to make use of an extending force with all possible advantage, and to excite thereby the least pain and inconvenience, it is necessary that all parts serving to the motion of the dislocated joint, or in any degree connected with it, be put into such a state as to give the smallest possible degree of resistance.

6. That in the reduction of such joints as consist of a round head, moving in an acromioid or socket, no attempt ought to be made for moving the said head, until it has by extension been brought forth from the place where it is, and nearly to a level with the said socket. This will show us, says Mr. Pott, a fault in the common rule, and why that kind of rule which Mr. Pott called his comestible, is a much better instrument than any of those, or indeed than it; because it is a lever joined to an extensor; and that capital of being joined with the arm in such position as to rupture the least extensors, and to subvert the joint; besides which it is graduated, and therefore perfectly under the dominion of the operator. It will show us why the old method, by the elbow or ladder, sometimes produced a fracture of the neck of the scapula; as Mr. Pott says it do himself. Why, if a sufficient degree of extension be not made, we are driven over the narrow shoulder, and under the patient's axilla, and thus prove an impediment rather than an assistance by turning the head of the humerus under the neck of the scapula, instead of directing it into its socket. Why the bar, or rolling-pin, under the axilla produces the same effect. Why the common method of bending the arm (that is, the so termed *sementum*), before sufficient extension has been made, prevents the very thing aimed at, by pushing the head in the same under the scapula, whilst the instatement of the extremity for a few seconds only would have carried into its proper place. To the observation that great extension only draws the head of the bone out from the axilla, which it is indeed, but does not replace it in the acromioid scapula. Mr. Pott replies, that when the head of the os humeri is drawn forth from the axilla, and brought

to a level with the cap of the scapula, it must be a very great and very unnecessary addition of external force, that will do us less good than harm. All that the surgeon has to do is to bring it to such level; the muscles attached to the bone will do the rest for him, and that whether he will or not.

7. Another of Pott's principles is, that whatever kind or degree of force may be found necessary for the reduction of a lacerated joint, that such force be employed gradually; that the lower degree be always first tried, and that it be increased gradually.—(See *Pott's Case*, Works, vol. 1.)

The supposition of the reduction being necessary prevented by the capsular ligaments, Dr. A. Cooper considers erroneous. He argues, that in *Dislocationes* from violence, these ligaments are always extensively lacerated; and that the head of the neck of the bone being put or confined by them, is altogether immovable.—(See *Surg. Essays*, part 1, p. 18.) But, in addition to the resistance of the muscles, there are, in all dislocations, three circumstances pointed out by him as causes of the difficulty of reduction. 1. The extensibility of the bone contracts adhesions to the surrounding parts, so that in dislocation, even when the muscles are relaxed, the bone cannot be reduced. In this state, he says the head of a radius, which had been long dislocated upon the external condyle, and which is preserved in the collection of Dr. Thomson's Hospital, is a rigid state to his also seen in a dislocated head of the humerus.—(See *Dislocationes*, p. 25.) 2. The socket is sometimes filled up with ossified matter. 3. A new long socket is sometimes formed, in which the head of the bone is so completely confined that it cannot be extruded without breaking its new indolent.—(See *Surg. Essays*, part 1, p. 23; and *Treatise*, &c. p. 13.)

Dislocations in general cannot be reduced without trouble; but after the reduction is accomplished, it is easily maintained. On the contrary, fractures are, for the most part, easy of reduction; but cannot be kept in this desirable state without difficulty. The greatest extension is resisted, the muscles act, the ends of the broken bone slip out of their proper situation with regard to each other, and the inferior of the limb recedes. As a modern writer has observed, the reduction is only a small part of the treatment of fractures; the most essential point of it is the almost daily care which a fracture demands during the whole time requisite for its consolidation. The contrary is the case in dislocations. Here, as far as the reduction is every thing, if we get out of consideration the less frequent cases in which the dislocation is complicated, and attended with such grave circumstances as render it indispensably necessary to continue for a length of time the almost constant care. But even then the protracted treatment is less for the dislocation itself than for the extraordinary circumstances with which it is accompanied.—(See *Revue, Parallele de la Chirurgie Anglaise avec la Chirurgie Française*, p. 387.)

All the ancient writers recommended the extending force to be applied to the lacerated bone; for instance, above the knee in dislocations of the thigh bone, and above the elbow in those of the humerus. We have stated that Pott advised this plan, and the same practice, which is approved by J. L. Pott, Deverney, and Callison, is almost generally adopted in the present day.

However, many of the best modern surgeons in France, for instance, Falga, D'Apigny, Desault, Boer, Roussin, and Leveillé, advise the extending force not to be applied on the lacerated bone, but on that with which it is articulated, and as far as possible from it. It is said that this plan has two most important advantages: first, the muscles which surround the dislocated bone are not compressed, nor accumulated in spasmodic contractions, which would oppose the reduction; secondly, the extending force is much more considerable than in the other mode; for, by using a long lever, we obtain a greater degree of power.

In Pott's remarks, we find even less information as to the prevailing prejudice against the above practice, and part of the extending force is lost on the joint intervening between the dislocation and the part attached to the extremity made. This notion is quite unfounded, as every man, who efforts for our treatment, must soon perceive. When extension is made at the wrist, the ligaments, muscles, &c. which connect the bones of the forearm with the os brachii, draw the whole of the

extending three centimetres on them, and they must obviously transmit the same degree of extension which they receive in the bone above, in which they are attached. Indeed, this matter seems so plain, that I think it would be an insult to the reader's understanding to say any more about it, than that such resistant sarcomeres have contrary extension can never have taken the trouble to exert for themselves on this particular subject. Whether this force necessary to be exerted in some instances would have a bad effect on the surrounding joint, may yet be a question; but as De-sault's practice was very extensive, and he did not find any objection of this kind, perhaps we have no right to conclude that such would exist.

If, however, the necessary extension to Desault's plan of applying the extending force be attended, the question still remains to be settled, whether this practice is most advantageous on the grounds above specified. This is a point which, perhaps, cannot be at once pronounced decided altogether in the negative or the affirmative, since what may be best in one kind of dislocation may not be so in another. Thus, Sir A. Cooper states, that as far as he has had opportunity of observing, it is generally best to apply the extension in the bone which is dislocated: but first dislocations of the shoulder are exceptions in which he mostly prefers to reduce the head of the bone, by placing his hand in the armpit, and drawing the arm at the wrist in a line with the side of the body, whereby the pectoralis major and latissimus dorsi are kept at a relaxed state. (*Surgical Essays*, part 1, p. 25.)

Extension may either be made by means of assistants, who are to take hold of pulleys or straps, just round the part at which it is judged proper to make the extension; or else a multiplied pulley may be used. In cases of difficulty, Sir A. Cooper thinks the pulley should always be preferred. "When assistants are employed, their exertions are sudden, violent, and sudden if dislocated, and the force is more likely to produce laceration of parts, than to remove the bone to its situation. Their efforts are also often uncoordinated, and their muscles are necessarily fatigued, as those of the patient, whose resistance they are employed to overcome." In dislocations of the hip-joint, and in those of the shoulder which take long irregular pulleys should always be employed.—(*Surgical Essays*, part 1, p. 24.) But whether pulleys be used or not, nothing more need be added to what Mr. Pott has stated, respecting the propriety of using moderate force in the first instance, and increasing the extending power very gradually.

The extension should always be first made in the same direction in which the dislocated bone is moved; but as frequently as the muscles yield, the bone will be gradually brought back to its natural position. Thus the head of the bone becomes disengaged from the parts among which it has been placed, and is brought back to the acetabulum cavity again by being made to follow the same course which it took in coming from it.

Extension will prove quite unreailing, unless the bone, with which the dislocated end is naturally articulated, be kept motionless by counter-extension, or a force at least equal to the other, but made in a contrary direction.

The mode of fixing the scapula and pelvis, in situations of the shoulder and thigh, will be familiarly described.

In dislocations of acromioclavicular joints, extension and counter-extension are only made for the purpose of diminishing the friction of the surfaces of the joints, so that the reduction may be effected more easily.

When the attempt at reduction fails, the want of success is sometimes owing to the dislocation not being perfectly enough, and the great muscular strength of the patient, which commands all efforts to replace the bone.

In the latter case, the patient may be very kind, and not use a superfluous word to make him faint. The opening in the cloth should be made large, because a sudden evacuation of blood is immediately to produce weakness and swooning, than a gradual discharge of it and the oil, for the same reason, may be tied as it stands up. In very difficult cases, the expedient of incision has been recommended, as, when the patient is in this state, his muscles are incapable of making good resistance to extension. These three circumstances, which in this country are almost always met with, are

"The bones to be employed for the reduction of dislocations (says Sir Astley Cooper) are both quadrilateral and triangular. It is generally wrong to insert force only, as it becomes necessary to use it in such a degree as to occasion fracture and injury; which will be shown in the sequel, that the most powerful mechanical means fail, when resisted by immovable muscles. The power of the muscles, in the first instance, is to be duly appreciated; as this forms the principal cause of resistance. The best instrument to use is to be chosen for the purpose of reduction, are those which produce a velocity to escape, and this velocity of it may be best secured by one or other of the following means, viz. by bleeding, warm baths, and caustics. Of these means, I consider bleeding the most powerful; and that the effect may be produced as quickly as possible, the blood should be drawn from a large orifice, and the patient kept in the erect position; for by this method of bleeding, syncope is produced before so large a quantity of blood is made before the patient is lost. However the activity of the muscles must be regulated by the construction of the joint, as the accident happens to all the varieties of construction; it must not be lost down as a general rule, but when the patient is young, delicate, and muscular, the quantity removed should be considerable, and the method of taking it every that which I have described.

Secondly, in those cases where the warm bath may be thought proper, if where it may be considered improper to carry bleeding any further, the bath should be employed at the temperature of 100° or 110° and as the water is the same as in the application of the last remedy, the person should be kept in the bath at the same heat till the relaxing effect is produced, when he should be immediately placed in a chair, wrapped in a blanket, and the mechanical means employed.

Occasionally, I have perceived a third mode of increasing the action of the muscles, by relaxing some of the muscles of the antagonist; but as this is a step, frequently producing vomiting, which is necessary, I rather recommend its application, chiefly to keep up the state of syncope, already produced by the two preceding means, which are relaxing efforts will most readily do, and so potentially overcome the tone of the muscles, that dislocation may be reduced with much less effort, and at a much less distant period from the accident than can be effected in any other way." (*Sir A. Cooper on Dislocations*, vol. 2, p. 24. See also, *Surgical Essays*, part 1, p. 25.) In cases of radical difficulty, the use of anæsthetic laudanum, applied with the warm bath and bleeding, seems rational and judicious; but except in cases of that description, I should prefer the counter-extension, as it overcomes the resistance of the muscles, which will at last overcome the resistance of the most athletic man. Sometimes the resistance made to reduction by muscles, acting in opposition to the will, may be subdued by the patient's attention being suddenly taken from the injured part, at which moment the action of these muscles is suspended, and a very little effort on the part of the surgeon will subdue the bone. A case, illustrating this circumstance, is recorded by Sir A. Cooper. (*Surgical Essays*, part 1, p. 25) and (Pott, loc. cit. p. 24.)

Dislocations of articular joints can seldom be reduced after a month, though by means of great force Desault used to succeed at the end of three or four. Dislocations of acromioclavicular articulations generally become irreducible in twenty or twenty-four days, in consequence of mortification.

The reduction of a dislocation is known by the diminishing of the natural length, shape, and direction, and being able to perform certain motions, not possible while the bone was out of its place. The patient experiences a great and sudden diminution of pain; and very often the head of the bone makes a noise at the moment when it comes into the cavity of the joint.

Sir Astley Cooper believes, that much mischief is produced by attempts to reduce dislocations of long standing by very unskillful persons. He has seen great contractions of the intermuscles, laceration, and laceration of the tendons, and stretching of the peroneal tendon in an anæsthetic and paralysis of the hand, without an abortive attempt to reduce a dislocation in the shoulder. He is of opinion that three months be the shoulder, and eight weeks for the long arm be set down as the period from that moment, when it would be dangerous to make the attempt, unless in progress of very ex-

laced face, or advanced age.—*One* *Fracture of the radius*, *Am. J.*, p. 25.) I have seen two cases, in which very great force was exerted with pulleys, to reduce the thigh-bone at the end of three or four weeks; but the attempts completely failed. However, the success is to be delayed from properly restoring the strength of the muscles previously, by means of moderately doses of arsenic, the weak hand, &c., was not more taken advantage of. A dislocation of the upper head of the radius, of about a fortnight's standing, I have shown twice, at the elbow of two of the most robust carpenters in London.

[The reduction resulting from violence due to the strength of the neighbouring parts in attempts at dislocation, are often much greater than those to which Mr. Cooper alludes in the preceding paragraph. The 5th drawing extract is taken from the last edition of the *First Lecture*, and may be found in a paper by the Philadelphia editor, vol. 2, p. 491.]

On the third volume of the *Repertoire d'Anatomie*, some cases of luxated situation of the hip-joint, in which severe mischief arose from the attempts to reduce the parts, are reported by M. Harbert, M.D. In one case, one of the auxiliary nerves was torn from the spinal marrow; and in others, pneumonia of the lung was the result. After having succeeded completely in several previous attempts, Professor Goussier has within a few years met with two instances in which the auxiliary artery, having formed anastomotic adhesions, was torn, and the death of the patients consequently resulted from the attempts at reduction.

One of these cases is reported in the third number of the *Am. Journal of the Med. Sciences*. The patient, a stout, muscular, athletic man, about six feet high, applied to Professor Goussier on account of a luxation of the left hip-joint at the shoulder-girdle, of some weeks' standing. He was admitted into the Alton House Infirmary on the 6th of March; the anastomotic vessels were pressed until the 15th, when attempts at reduction were made, in the presence of the surgeons and students of the house, which was not accomplished until after the lapse of an hour and three-quarters from the commencement of the operation.

On the 18th, there was a general swelling over the deltoid and pectoral muscles, with a distinct pulsation of an anastomotic character. On the morning of the 19th, it had increased considerably, and in consequence it was decided that the reduction every should be deferred without delay. This was accordingly done by Professor G.

This patient died on the tenth day after the luxation of the shoulder-joint. The details of the case, and the treatment, which was highly interesting, may be found in the 3d No. of the *Am. Journal of the Med. Sciences*. The writer then adds, "These who are acquainted with the professional skill of Professor G. will attribute the failure in this case to the proper cause, the 'fatal adhesion of the artery to the head of the bone,' and a like result must necessarily have followed its reduction by the hands of any other surgeon. As the result of his experience, Professor G. has drawn some conclusions of enormous practical value, and to which we must do much justice cannot be just." "It," says Professor G., "the patient is young, not very muscular, the luxation not accompanied with fracture—if no adhesions have previously been made to secure the reduction, and the head of the bone has not been out of its natural situation beyond five or six weeks, I should advise the attempt to reduce it. But, on the contrary, if the patient is very robust and vigorous, advanced in years, accompanied by labour and to the use of much spirits, and the head of the bone has been long out, I should discourage every attempt at reduction."—*Edin.*

In order to keep the bone from slipping out of its place again, we have only to hinder the first bone moving. When spirits will not sufficiently support the joint, they are very often used, such dislocations of the ankle, wrist, &c. At the same time, the hand, except when at some distance from the body, a restraint of the dislocation will be prevented by confining the arm close to the side in a sling. The proper bandage, applied after such an accident, leaves satisfaction to the patient, than really efficacious. Whatever bandage is used to keep the arm from moving, should be put on the inner side of the arm, as far as possible from

the centre of motion. According to Sir Astley Cooper, the hip is rarely dislocated a second time; but the humerus and the lower jaw very frequently slip again from their sockets, which are shallow. Bandages for the prevention of this return of displacement are, therefore, in such cases, particularly necessary. This is required for some time after the reduction, in order that the repaired ligaments may unite. The strength of the shoulder, Ac. may now be greatly promoted by friction, and pouring cold water over the limb.—(*On Dislocations*, p. 30.)

When a bone is broken and dislocated, an endeavour should be made to reduce the dislocation without loss of time, and then pay attention to the fracture. Also, if there be a compound fracture of the bone, and a dislocation of the shoulder, the fracture is to be secured in splints, and the dislocation then reduced.—(*See A. Cooper on Dislocations*, p. 18.) The case of a bone, dislocated and fractured at the same time, might be attended with considerable difficulty of reduction; for, finally, it is a very uncommon accident.

SYMPTOMS OF DISLOCATIONS.

Common dislocations are those which are attended with a second consequence, with the rupture of the ligamentous parts. Some joints are much more disposed than others to compound dislocations. The shoulder scarcely ever takes place at the hip. Sir Astley Cooper has given one instance of it at the shoulder, and he has seen one of the knee; but the case every frequent in the ankle, elbow, and wrist.—(*On Dislocations*, p. 13.) In most instances, the swelling in the skin is caused by the protrusion of the bone, and sometimes by the part having struck against a hard or an irregular body. Cases of dislocation are frequently attended with great danger, and the same anxiety of judgment is requisite in determining whether amputation ought to be immediately performed, or an effort made to preserve the limb, as in compound fractures, and bad gunshot injuries; and many of the observations which I shall have to offer upon the latter subjects, will, for the most part, be applicable to the present.

When the location of a large joint is compared with an external wound, leading into the capsular ligament, it is a circumstance that has a particular tendency to increase the danger. In many cases, injuries of this description are followed by violent and extensive inflammation, abscesses, mortification, fever, colic, and death. When the patient is advanced in years, much debilitated, or of an unusually sensitive constitution, a compound luxation, especially if attended with much contusion and other injury of the soft parts, and wrongly treated, very often has a fatal termination. This, however, is not the general event of compound dislocations; and whatever may have happened in former times, we now know, that in the present improved state of surgery, these accidents rarely attend cure. This statement may be made, without any reserve being run upon every instance of amputation performed in such cases. I know that this operation is sometimes indispensable directly after the luxation, and I am equally aware, that it may become necessary in a future stage, when violent abscesses or sloughing joined with threatening constitutional symptoms have taken place. My only design is to recommend the caution to cure the general type of compound luxations, but if a case were to present itself, attended with extreme contusion and laceration of the soft parts, I should be as anxious an advocate for amputation as any surgeon.

Mr. Harvesy, surgeon to the Royal Naval Hospital, Plymouth, is speaking of compound dislocations of the ankle, where amputation, "where the lower head of the tibia and fibula are very much shattered; when, together with the compound dislocation of these bones some of the vessels being torn, are displaced and exposed; where any large vessels are divided, and cannot be secured without excessive enlargement of the wound and disturbance of the soft parts; where the constant interference with the neighbouring vessels and muscles, are considerably torn; where the protruded bone cannot by any means be reduced; and where the dislocation is situated at the risk of the membrane, and not likely to endure pain, discharge, and length of confinement."—*A. Cooper's Surgical Essays*, vol. 2, p. 145.) "Pain," as general remarks, these are all

be the cause; but there are exceptions to them. Thus, we find in Sir A. Cooper's publication, several cases in which compound dislocations of the ankle terminated well, notwithstanding the displacement and removal of the astragalus,* other instances of which kind of ancone are to be found in the records of surgery.—(*See Dislocation, in Flexura, Med. Medica*, Percy, in *Journal de Med. Chirurgie*, Nov. 1811, p. 248.) However, if the ends of the tibia and tarseal bones, especially the astragalus and os cuneiforme, are broken, the separation of the bones is recommended as high authority.—(*See A. Cooper's Surg. Essays*, part 5, p. 191.) And with regard to the division of large bloodvessels, Sir A. Cooper states, that he would not at once proceed to amputation on that account. "The case from Mr. Hagelrich of Wittenberg, sent me by Mr. Caden, clearly shows, that the division of the inferior iliac artery does not, if it be well secured, prevent the patient's recovery. I also once saw a compound fracture, almost the middle-joint, accompanied by a division of that artery, and, although the patient was in the hospital, and a barber's servant, who possessed the most constitution to struggle against severe injuries, yet this man recovered without amputation." Now, in Sir A. Cooper's opinion, would all legs be preserved, even if the posterior tibial artery was injured.—(*Vol. vi, p. 180*.) For the method of securing these vessels, see *Articuli*.

The following are the circumstances, when Sir A. Cooper has known give rise to the necessity for amputation of compound dislocations of the ankle. 1. The advanced age of the patient. 2. A very extensive lacerated wound. 3. Difficulty of reducing the ends of the bones. 4. The necessity rather as a reason for saving them off, than for amputation. 5. The extensive shattered state of the bones. 6. Involvement of the tibia towards more greater injury of the bones and soft parts than those towards, and were frequently require amputation. 7. Sometimes the bone cannot be kept reduced, owing to the tibia in the dislocation, onwards being obliquely fractured. 8. Division of a large bloodvessel, attended with extensive wound of the soft parts. 9. Morbidity. 10. Extensive contusion. 11. Extensive suppuration. 12. Necrosis, when the sequestra do not absorb of removal. 13. Very great and permanent debility of the foot. 14. When tetanus comes on, Sir A. Cooper does not approve of the operation. 15. A very intolerable state of excruciating, such as is often met with in very fat subjects, who take no exercise.—(*See Dislocation, &c.*, p. 132, &c.)

The treatment of a compound dislocation requires the reduction to be effected without delay; and with as little violence and disturbance as possible. When the extremity of the bone protrudes, and is surrounded with sand or dirt, as frequently happens from its having reached the ground, it should be washed with warm water, as the best antiseptic matter admitted into the joint will promote and support a suppurative process, and the utmost care should be taken to remove every portion of it adhering to the end of the bone. If the bone be shattered, the finger as it be passed into the joint, and the detached pieces are to be removed, but that is to be done in the most gentle manner possible, so as not to occasion unnecessary irritation; and if the wound be of such a nature as to admit the finger with difficulty, will swallow loose pieces of bone even, be left, the integuments should be divided with a scalpel, to draw off such pieces having removed without violence.—(*See A. Cooper's Dislocation*, p. 129.) If any difficulty of reducing should arise from the bone being girt by the integuments, the operation in them should be divided with a scalpel. The first is then to be joined together, with the temporary pads, cotton-wool bandage, &c. Sir A. Cooper judiciously recommends the portions of the bandage to be sewed together. "I had present under the leg, so that one piece may be removed when it becomes stiff," and by fixing another to its end, before it is withdrawn, the fresh pads may be applied without any disturbance of the limb.—(*Surg. Essays*, part 2, p. 123.) The patient is to be freed from any day, stain of blood, or other extraneous matter, and no lips are to be accurately brought together with strips of adhesive plaster. Sir A. Cooper mentions the finger in the

blood which forms part the best kind of first dressing. The joint is to be covered with linen kept constantly wet with the liquor spiritus acetatis dilutus, or Rosh, what is better, spirit of wine and water; the bandage what is better laid down, and the spirits infused on it is to be loosely laid down, and the spirits infused on it is to be kept perfectly at rest in an upright posture. The patient, if young and young, is to be bled. This last practice may be more easily adopted in the country than in London, or large hospital. All nocturnal the first night or two will be highly proper. Saline draughts, cathartics, and a low regimen, are also indicated during the first few days of the sympathetic fever, which commonly follows, no means an accident.

According to Sir A. Cooper, purgatives should be used with the utmost caution: "So says he, there cannot be a more practice, when a limb has been placed in a good position, and adhesion is proceeding, than to disturb the processes of nature by the frequent changes of position which purges produce; and I am quite sure, that in cases of compound fracture, I have seen patients distressed by their frequent administration. That which is to be done by bleeding and purging the bowels should be effected rather as best in the after the accident, before the adhesive inflammation arises."—(*Surgical Essays*, part 1, p. 311.) Here the practitioner, according to Mr. Earle, would also give opiates to be used without any disturbance of the bowels.

If the case takes a favorable course, the constitutional fever will not be excessive, nor will the joint inflammation of the limb be considerable. Sometimes the wound states more at first without suppuration; a suppuration particularly desirable, as tending to maintain anything close to lessen the danger, by closing the raw, and were, from a compound into a simple one. In other cases the wound is not treated, but the inflammation and suppuration are not violent nor excessive, the constitution is not dangerously attacked, and hopes of ultimate cure may be reasonably entertained. When the wound is changed to land favorably, adhesive plaster, with or without lin, or a jacket of soft soap ointment is the best dressing. In other instances, while the suppuration is copious, and the parts are some and painful, emollient poultices are the most eligible.

When the sympathetic fever and joint inflammation symptoms are over, and much discharge prevails, attended with marks of approaching weakness, the patient is to be allowed more food, and dressed in flannel, calico, porter, wine, &c. If the night is troublesome, he must have opiates; if he remains restless, sedative salt; and, in short, all such medicine as he particular complaints may require are to be prescribed.

When the inflammation of a compound dislocation is violent and excessive, general bleeding, the application of leeches, and the use of fomentations and poultices, are the most likely means of lessening the mischief. Yet it is only in strong habits that venesection is any resort can be prudently pursued in large cities or crowded hospitals.

The following are the instructions delivered by Sir A. Cooper on the subject of dressings. "If the patient complains of considerable pain at the joint, in four or five days the bandage may be used to restrain the motion; and if there be much inflammation, a wet of the joint (or other dressing) should be laid on the wound, or give vent to any matter which may be formed; but this ought to be done with great consideration, as there is danger of increasing the adhesion between, if that be proceeding without opportunity of the local treatment, it will every day and the danger, that the wound will be closed by adhesion, but if in a few days it be not, and suppuration set in, the matter should have an opportunity of coming out, and the last being removed, simple dressing should be applied. After a week or ten days, if there be suppuration with much surrounding inflammation, poultices should be applied upon the wound, before it is in neighborhood, and upon the limb at a distance (the spreading matter should still be employed) but as soon as the inflammation is lessened, the poultice should be discontinued."—(*Surgical Essays*, part 1, p. 123.)

In certain examples, the most suitable treatment is leeching. The joint and limb become affected with considerable pain and swelling, the fever runs high,

* Professor Stevens, of New-York, treated the astragalus in a case of profuse compound dislocation of the ankle-joint, and the case had an early and happy termination.—*News*.

delirium comes on, and the patient may even perish from the violence of the first symptoms, the limb being generally at the same time attacked by gangrene. If these first dangers are avoided, the wound may yet not heal favorably, the inflammation may be considerable, or of an erysipelas nature, large abscesses under the fascia may be formed, the bones may be affected with caries, and the local symptoms and sinking state of the patient may make the only chance of recovery depend upon amputation. But even this operation is sometimes deferred till too late, and the patient must be left to the tender mercies of fate.

Whether given the smallest reflection to the nature of compound dislocations, will perceive that it is often a matter of the highest importance to make a right decision at the very beginning, whether amputation should be immediately done, or an attempt made to save the limb. In some instances, the patient's sole chance depends upon the operation being performed at once, without the least delay, and the opportunity of doing it never returns. The surgeon should take off the limb as soon as he has seen the nature of the injury, and not wait till a general tendency to swelling and gangrene has spread through the tissues, and every action in the system is disturbed. Amputation under these circumstances is undoubtedly done with a very diminished chance of success, and, until certain facts were adduced by Baron Larrey, Mr. Lawrence, Mr. A. C. Hennen, and others, *that* of late years amputation profited—(See *Amputation and Dislocation* first.)

But, besides this first critical period, the surgeon often has to exercise a nice degree of judgment as to the extent of the saw; I mean when the amputation is complete, the wound open, the bones exposed, and the health impaired. Here the practitioner may sometimes err, in taking off a limb that ought to be saved, or he may commit a fatal blunder, and make the patient lose his life, in a fruitless attempt to save the member. No surgeon can form the right practice in this delicate part of surgery; genius alone cannot do it; the opportunity of making observations, and the talent of profiting by them, are here the things which make the consummate surgeon.

It should ever be recollected, it is urged to had compound dislocations, that as young subjects, and in a calid state of the system, many cases will do well, which in old persons, and in the polluted atmosphere of London, and crowded hospitals, would be fatal without amputation.

The regulations of some hospitals are so irritable, that whether an attempt be made to save the limb, or amputation be at once performed, the case has a rapid and fatal termination. According to Mr. A. Cooper, persons who are overloaded with fat "are generally irritable, and bear important accidents very ill; indeed, says he, "they generally do, whatever plan of treatment be pursued."—However, he adds that some corpulent people as soon as a great deal of exercise, form exceptions to the foregoing remark—(*Surgical Essays*, part 2, p. 185).

There is a practice in regard to compound dislocations, which I think ought at all events to be adopted only in a very few cases; I mean the plan of sawing off the head of the dislocated bone. According to Le Boe, this method is recommended by Hippocrates, as a means of amputating and protecting the bone—(*Medicæ Doctrinæ Chirurgicalis*, l. 2, p. 15). However, it seems not to have been sufficient good in ancient times to have obtained a lasting reputation. At last, when a case mentioned by Mr. John Gooch, it first drew into vogue, and it was received as an entirely new proposal. "A compound dislocation says this author, is of a most dangerous nature than compound fractures, the very pain causes it; but if a surgeon acted judiciously in relation to attempt saving a limb under such threatening circumstances, I am inclined to think, from what I have observed, to well be more likely to succeed by sawing off the head of the bone, especially if it has long been out of joint, and exposed to the air."

Mr. Gooch afterwards gives notice of a case in which Mr. Cooper, of Glasgow, saved off the head of the tibia and fibula, and preserved the limb; the patient being able to walk and work for he has been for many years afterwards. Other attempts are also briefly mentioned, in which the lower end of the tibia was sawn off, and the head of the second bone left in situ.

The late Mr. Hey, of Leeds, was known to make Van L—U

trial of this plan in a compound luxation of the ankle. The example, however, which he published, is decidedly reprehensible to the practice, as the following passage will show:—"I was in hopes that this patient would have been able to walk, actually; but in this I was disappointed." He walked indeed without a crutch; but his gait was slow, his leg remaining weak, and his toes remaining numb, which rather surprised me, as his leg was very straight when I caused standing him."

Mr. Hey did not make this case with the view of recommending a similar practice in all cases of this accident; for he had not always adopted it, but was he of opinion, that the same mode of treatment, whether by separating the bones, saving off their extremities, or amputating the limb, ought to be universally practised. When the luxation of the os capitulum and isomphysis is not greater than is sufficient to permit the head of the tibia to pass through them, and when, at the same time the joint or contiguous parts have suffered no other injury, Mr. Hey recommends the re-joining of the bones, and a union of the disjuncts by wires, with the treatment adapted to wounds of the joints—(*Practical Observations on Surgery*, chap. II, art. 5).

That in other cases recorded by Mr. Gooch and Mr. Hey the patients recovered with a new joint, only proves in my mind the great importance and facility of nature, and her successful struggle over the opposition she meets with from bad and unskilful surgery. A limb so injured that it were afterwards to alter than its fellow, and consequently the patient be none or less a cripple. We have seen, that in the only instance published by Mr. Hey, considerable deformity was the consequence of this practice. I cannot help adding my belief, that the position would have experienced more success in the treatment of compound dislocations, had he recommended the objectionable method of sawing to the socket. In such accidents every kind of irritation should be avoided as much as possible, and that the wound may be satisfactorily closed with sewing plastic the observation of an experienced man in St. Bartholomew's Hospital has perfectly convinced me. In this institution, under the disadvantages of the air of London, and an hospital, compound fractures used, at the period when I was an apprentice there, to be treated with marked success; and I feel warranted in ascribing the success to the mode of treatment, which was conducted on the principles explained in the section of the Dictionary.

The most ingenious arguments which have yet been tried in behalf of the practice of sawing off the heads of the bones in compound dislocations of the ankle, are those recently published by Mr. A. Cooper. However, he does not adopt the plan without restrictions. If the dislocation (says he) can be easily reduced, without sawing off the end of the bone; if it be no too extensively broken to remain firmly upon the articular surface being retained; if the end of the bone be not shattered, for then the small loose pieces of bone should be removed, and the surface of the bone be smoothed by the saw; if the patient be not extremely irritable, and the vessels affected with violent spasms, impeding reduction, and causing a displacement at the bones after they have been reduced; Mr. Ashley Cooper advises the incomplete reduction of the parts, and leaving the wound by adhesion. In the opposite circumstances, rather than separate the limb he would cut off the ends of the bones—(*Surgical Essays*, part I, p. 154. Treatise, p. 205).

The only case in which the plan of sawing off the head of the bone can be at all proper, is when a compound dislocation cannot be reduced, notwithstanding the advantages of the wound in the skin, and every other possible means. There is no other mode of preventing the formidable symptoms which would result were the bone left in a state of promiscuity through the integuments; nor is there any better way of alleviating such symptoms after they have actually begun. Mr. Reed gives much proof to the English surgeons for the painless efficacy which they have arrived in cases of this description. Although Fabrice, Bibras, Perard, Desault, Larrey, and several other French surgeons, have, like every English practitioner, endeavored to remove the whole of the integuments, when the bone was totally separated from the synchondrosis, and proceeded in compound situations, yet Mr. Reed acknowledges that the best practice of saving off the

lower end of the hamula, the lower end of the radius, the lower end of the tibia, and also of the fibula, at the same time, originated with, and was first exposed by, English surgeons.—(Perrault, p. 34. Chirurgie anglaise, and in *Chirurgie Française*, p. 205, 1804.)

DISLOCATIONS OF THE LOWER JAW.

The lower jaw can only be limited forwards, and either one or both of its condyles may become displaced in this direction. Every dislocation except that forwards is rendered impossible by the form of the parts. The lower jaw cannot even be dislocated forwards, unless the mouth, just before the occurrence of the accident, be very much open. Whenever the chin is considerably depressed, the condyles slide from behind forwards under the ascending root of the zygomatic process.—The cartilaginous cap which envelops the condyles, and follows them in all their motions, still affords them an articular activity; but the depression of the bone containing the ligaments give way, and condyles glide before the ascending articular surface, and slip under the zygomatic arch. Hence a dislocation mostly happens while the patient is laughing, yawning, &c. A blow on the jaw, when the mouth is wide open, may easily cause the accident. The case has occasionally arisen from the exercise of great force in disengaging the teeth. Dr Astley Cooper has known a complete luxation, that is to say, of both condyles, produced by a boy suddenly putting an apple into his mouth to keep it from the reach of a play-fellow.—(On Dislocations, p. 269.) Whenever the jaw has once been dislocated, the same causes more easily reproduce the accident. In certain individuals the ligaments are so loose, and the muscles so weak, that a dislocation is produced by any slight attempt to yawn, laugh, or (as Lematre has observed) to bite any substance which is rather large.—(Lematre, *Nouvelle Médecine Chirurgicale*, tom. 2, p. 51.) There have been persons who could scarcely ever laugh heartily without their lower jaws being luxated. But of all the causes of this occurrence, yawning alone, even without the violence of any external force, is by far the most common.

When the jaw is depressed, and its angles, to the external sides of which the hamuli are attached, are turned upwards and backwards, if these muscles contract, the greater part of their force tends to bring the condyles into the zygomatic depression.—(Boyer.)

Dislocations of the lower jaw are attended with a great deal of pain, which Boyer ascribes to the pressure produced by the condyles on the depressed temporal alveoli, and those going to the zygomatic process, which serves now, before the mouth of the zygomatic process. The mouth is wide open, and cannot be shut. It is more open to vent the condyles than in those which have continued for some time. An empty space is left before the ear in the natural position of the condyles. The external process lies under the cheek-bone in a prominent, which may be felt through the cheek outside with the mouth. The cheek and temple are flattened by the lengthening of the temporal, zygomatic, and buccinator muscles. The subject feels a large elevation from the mouth, the secretion of which fluid is greatly increased by the irritation of the accident. The arch formed by the teeth of the lower jaw is situated more forward than that formed by the teeth of the upper jaw. During the first five days after the accident, the patient can neither speak nor swallow.—(Boyer.) When only one condyle is dislocated, the mouth is distorted, and turned towards the opposite side, while the fellow-teeth of the jaw do not correspond. However, Mr. Hey asserts, that frequently the position of the chin is not perceptibly altered.—(Practical Observations, p. 229.) The mouth cannot be shut; but it is not so widely open as in the complete luxation.—(Mr. J. Cooper on Dislocations, p. 291.)

When a dislocated jaw has remained unreduced for several days or weeks, the zygomatic arch is well matched. In such instances, the chin becomes gradually approximated to the upper jaw; the patient gradually regains the faculty of speaking, and swallowing; but the zygomatic, and the other muscles from the mouth. The suffering caused by a dislocated jaw, is so great, very often more fatal if the case continues unreduced; and we are not to believe Hippocrates, when he positively declares the accident painful if not reduced before the sixth day. Indeed, Mr Astley

Cooper, in relating the severity of the pain, remarks, that he has seen some very dangerous effects produced on the system, that in some the jaw becomes more closed, and a considerable degree of ankylosis is formed.—(On Dislocations, p. 269.)

Moragni attended a man, two months after such a luxation, which had not been reduced, and found the zygomatic process of the maxilla so fixed, though it was the zygomatic of this sort under his eye.—(Lematre, *Nouvelle Médecine Chirurgicale*, t. 2, p. 58.)

Dislocation of the lower jaw may be reduced in the following manner: The surgeon is first to bring the hand round his thumb, to keep them from being cut by the patient's teeth, and then introduce them into the mouth, as far as possible along the grinding teeth. At the same time he is to place his fingers under the chin and base of the jaw, and while he presses the condyles with his thumbs, he moves the chin with his fingers, by which means the condyles become disengaged from their situation under the zygoma; a gag is then introduced under these parts so rapidly back into the articular cavities again, and then upon a suitable right-angle surface, he has, he is to immediately move them outwardly between the chin and the jaw.

The reduction being accomplished, a firm plaster-cast is to be provided by applying a wire-net bandage, as recommended for the fractured jaw. For a few days the patient should avoid such and so require much resolution.

The zygomatic used to place between the grinding teeth two pieces of stick, and while they rest firm is better to depress the back part of the chin, they must the chin by means of a bandage. The late Dr Ferrius, the dentist, had a patient whose jaw was dislocated on both sides in the direction of a tooth; the reduction was first effected on one side by placing a piece of wood a foot long upon the grinding, and then using the part of it which was laid in the hand. He then put reduced the other condyle in the same manner. Mr Astley Cooper, in reducing a complete luxation of the lower jaw, pressed pulling the patient in the supine position, introducing two cords behind the neck teeth, and then separating the chin.—(On Dislocations, p. 291.) When only one condyle is dislocated, whatever method of reduction be followed, it need only be applied to the side affected.

DISLOCATIONS OF THE VERTEBRÆ.

What have been called dislocations of the spine are considered by the Astley Cooper as really fractures of the vertebra, with displacement of the lower part of the intervertebral substance. The only true dislocation of the spine described by him, are those of the first and second cervical vertebra.—(On Dislocations, &c. p. 37.)

The large surfaces with which the vertebrae support each other, the number and thickness of their ligaments, the strength of their muscles, the high degree of motion which each vertebra naturally has; and the vertical direction of the intervertebral substance, so perfectly opposed to make dislocations of the dorsal and lumbar vertebrae impossible, unless there is some extraordinary violence, and a great deal of pressure. Thus Mr Astley Cooper, in the very extensive experience, has not witnessed a separation of one vertebra from another, through the intervertebral substance, without fracture of the articular process, or, if those processes remained unfractured, without a fracture through the body of the vertebra. On some cases, I shall shortly remark, that they can only result from external violence, that the symptoms would be an irregularity in the disposition of the separate processes, fracture or laceration of the uniaxial and fovea, paravertebral and a morbid state of the lower extremities, the effects of the pressure or other injury, to which the spinal marrow would be exposed. Similar symptoms may ensue when the spinal marrow is directly lacerated by a local contusion, without any fracture or dislocation whatever; and it is certain, that most of the cases mentioned by authors as dislocations of the lumbar and dorsal vertebrae, have only been various kinds of deep and narrow, or fractures of these bones.

The cervical vertebrae, however, not having sufficient anterior surfaces, and having more motion, are occasionally dislocated. The intervertebral of the first and second, and of the first and second

Downward, particularly the hair receptors, is the most common, but fractures of the cervical vertebrae, lower down, though very rare, are possible. Indeed, according to Hoyer, many examples have followed, in which one of the ligamentous bands, or artificial processes of a cervical vertebra have been dislocated, so as to cause a permanent inflexion of the neck, typically the same as that of that of the dislocation. — *Traité des Mal.* (1819, t. 4, p. 114.)

Whether the case published by Mr. C. Ball under the name of a substitution of the spine, ought to be received as an important specimen of a displacement is to be decided from the first dorsal vertebra, I cannot venture to determine. The entire spaces of an ordinary lumbar between these 19th taken; if a considerable space between them; if the interruption of the intervertebral substance; and of an unusual quantity of the spread the distal part of the spine, an circumstance would be the object. "At the back part, the 19th vertebra under the scapula, and on the 19th just was bounded by the scapula," and in the spread spinal a had proceeded through the whole length of the shaft to the caudal region. (C. Ball, Surg. Obs. vol. 1, p. 189.)

Rare specimens, however, that even the larval and adult vermiform may be dislocated.—(*With the following*—p. 71.) Mr. Bell also describes a case of complete dislocation of the tail, dorsal from the first lumbar vertebra, with entire division of the spinal cord. A small portion of bone was broken off.—(*On the anatomy of the Spine and Trachea*, p. 52, pl. 2, fig. 5 and 2.) We learn from Mr. Lawrence, that in the museum of St. Bartholomew's Hospital, there are specimens of lumbar cervical vertebrae. In one of these, the right inferior articular process of the fifth vertebra is dislocated backwards. The portion of the vertebral column above the seat of the injury is twisted to the left, and the body of the fifth, having been partially dislocated, projects beyond that of the sixth vertebra. This displacement would not have been effected without a considerable injury of the dislocation. The upper and anterior part of the body of the sixth and seventh vertebrae have been slightly fractured on the left side. In another case, the inferior articular processes of the fifth cervical vertebra are partially separated from those of the sixth. The bodies of the two bones are partially separated behind. A third specimen exhibits a dislocation of the sixth from the seventh cervical vertebra. The inferior articular processes of the sixth are completely dislocated forward, and its body projects over that of the seventh. Mr. Lawrence has recorded this case, proving that vertebral dislocation both of the inferior processes and body, without fracture, may occur in the cervical region of the spine.—(*See Med. and Surg. Trans. vol. 18, p. 261, 262*.)

RESECTION OF THE HEAD FROM THE FIRST
VERTEBRAE OF CERVICAL.

The os occipital and the cervical vertebrae are usually connected by ligaments, that there is no motion of their being separated. Says an external enemy, and even the accident to happen, it would excessively irritate, by the irreparable compression and injury of the spinal column.

[illegible]

involvement, in those, alternating with pain in the neck, which seems to be about the back of the head, and sometimes elsewhere on morning that part. The head inclines forward, more slender, the face being turned a little down; but, in general, the articulations are affected in one side only, and that side the left in seven out of nine examinations after death. In both sides are affected, the head will incline differently damaged. In some cases things consisting for several weeks or months, and before these symptoms occur, there is often a general improvement, firmer motion, and more mental activities of the head, with the improvement in speaking and remembering matters; the pain becomes more severe and constant; the head finds a little back towards the right and inclines towards the opposite side. The patient complains if the head were too heavy, and beautifully supports it with his hands, when he leaves from the sitting to the lying position, or vice versa. This may be considered a pathognomonic symptom of the affection. Another symptom, which, at this period, shows the true nature of the disease, is a peculiar expression of pain in the occiput, which, combined with the position and stiffness of the head, constitutes so characteristic an inheritance of appearance, that it is enough to leave room if one is eager to recognize it again immediately after the further progress of the case, before in the head, vertebrae, pharynx, cranium and occiput, partial paralysis, particularly of the upper limbs, loss of vision, partial epileptic attacks, and hectic symptoms supervene. Generally, no external change is observable. After in the neck or in the spine, and first observed, it is even easier, consisting of the affected side, which rises and left in the neck. But throughout the pressure in the region of the three upper vertebrae is actually painful, and movement in the affected period of the disease, a feeling of rough surfaces is distinctly perceptible when the head is turned. The patient may restrain the motion in this helpless and painful state, and then dies, either from exhaustion and debility, or, which is more frequent, suddenly and unexpectedly."—*Lancet*, in *Med. Chir. Trans.*, vol. 12, p. 426.) These phenomena of displacement of the atlas may depend upon mere and accidental trauma of the articulation, or upon an erosive of its laminae, or upon a shallow tumor growing from the neighbouring surface of the os occipitale, or of the posterior part of the occipital bone. By dissection, the anterior or posterior arch, or one of the sides of the atlas, has been made to intersect a rib, the left arch and two-thirds of the diameter of the vertebrae broken. Notwithstanding these changes, life may be continued, and the craniæ functions performed satisfactorily, well qualified for enough either for the nervous system a large part, or for the articulations, binding together the head and most of the cervical vertebrae, to acquire gradually. The state of the nervous system, and the movement of the vertebrae of the neck, are necessarily beyond what would be necessary for simply maintaining the spinal marrow, so that the free lateral movements of the head and atlas can be executed without any risk of pressure on that important part. Some spontaneous displacements can occur at first, and in a considerable degree, without impairing the motions of the spinal cord.—(*Lancet*, in *Med. Chir. Trans.*, vol. 22, p. 411.) According to Boyer, the atlas never dislocated and certain when they dislocated, it is surrounded at least with the os occipitale, and only with two or one of the adjacent vertebrae. And other interesting facts, that in cases of this description, the part between the atlas and occiput is never a body one which is displaced and deformed, and, as a disease is very slightly allowed; for the attention of the practitioner, with the atlas, and vertebrae that at the point of the same process with the occiput, are considerably affected. Sometimes the process of the atlas and the occiput retain their natural position with respect to each other, and the atlas alone seems to be displaced between them. Sometimes the neck revolves in out of the place, with respect to the occiput, in the same direction, as the atlas, but not quite so great a degree. Finally, in some other instances, the two vertebrae are related in an opposite direction, so, the occiput, one to the left, the other to the right, or conversely. In case of the cases recorded above, this kind of lateral displacement is especially prominent, and is extensive, that an infirmity, or too loose in the neck, may left between the two

(with those of many other joints)—(On Dislocations, p. 245.)

The clavicle may be dislocated at its sternal extremity, forwards, backwards, and upwards, but never downwards, on account of the structure of the articulation of the first rib. The clavicle forwards is the most frequent; dislocations backwards and upwards are very unusual; and only rarely backwards is still more rare. This last case Dr. Asstley Cooper has never known arise from violence; but he observes that it might happen from a blow on the upper part of the bone, rupturing the capsular ligament and that between the clavicle and rib. The only instance of the dislocation backwards, with which this experienced surgeon is acquainted, proceeded from great debility of the spine. In this extraordinary case, the bone gradually slipped behind the sternum, and protruded so much inconspicuously by an incision in the emphysema, that the late Mr. Barne, of Glasgow, in Stafford, was obliged to remove the sternal extremity. — (Dr. Cooper on Dislocations, p. 244.)

If the dislocation be forwards, a hard, uncompressible tumour is felt, or even seen, on the front and upper part of the sternum. According to Bland, when the shoulder is carried downwards and outwards, the tumour disappears; but in Dr. Asstley Cooper's account, it is said, that the projection of the sternum will subside; if the shoulder be drawn backwards. The clavicle being elevated, the projection descends; if it be drawn forwards, the dislocated extremity of the bone becomes elevated to the neck. The motion of the sternum is painful, and the patient moves the shoulder with difficulty. The point of the injured clavicle (now distant from the central line of the sternum) then exerts. According to the same authority, the dislocation forwards is sometimes complete, only the tip of the capsular ligament being torn. The dislocation forwards is generally produced by a fall upon the point of the shoulder. When the force pushes the clavicle upwards and backwards, but it also frequently happens from falls upon the elbow, when this is separated from the side, and then the clavicle is propelled violently upwards and forwards against the anterior portion of the superior ligament. — (Dr. Cooper on Dislocations, p. 244.)

When the tumour is upwards, the distance between the sternal ends of the clavicle is diminished.

When the dislocation is backwards, there is a depression where the end of the clavicle ought to be, and the point of the bone forms a projection at the first and lower part of the neck, which, as Dr. L. Petit remarks, may compress the trachea, œsophagus, jugular vein, subclavian artery, and nerves. The head is inclined towards the side on which the clavicle itself is situated.

In reducing dislocations at the sternal end of the clavicle, we are to make a lever of the arm, by means of which the shoulder is brought outwards, and when thus brought outwards, it is to be pushed forwards, if the dislocation be in that direction; backwards, if the dislocation be behind; and upwards, if the dislocation be above.

The sternal portion of the arm, and the same apparatus as in fractures of the clavicle, are to be employed. The wedge-like pad, with its thick part towards the axilla, for the purpose of inclining the shoulder backwards, and for the support of the weight of the arm, and a bandage judiciously applied, are especially necessary. In consequence of the obliquity and smoothness of the articular surfaces, the reduction is easy, but great attention is requisite to prevent a return of the displacement.

Dislocation of the acromial end of the clavicle from the scapula. The clavicle upwards is almost the only one that ever occurs. It is possible, however, for the acromion to slip down downwards, and for the end of the clavicle to slip under the acromion. The rarity of dislocations of the acromial end of the clavicle is owing to the strength of the ligaments tying the clavicle and acromion together. While Demme and Boyer, however, represent these cases as being less common than dislocations of the sternal end of the bone, Dr. Asstley Cooper's extensive experience there is no more frequent. — (On Dislocations, p. 245.)

A fall on the top of the shoulder may cause the dislocation upwards. The acromial end of the clavicle then slides upwards on the scapula, and the shoulder is drawn upwards by the muscles which approximate the arm to the body. It has been asserted, that the violent action of the trapezius muscle in pulling the

clavicle upwards, may tend to produce the accident, but, as Dr. Asstley Cooper has remarked, the mechanism of this muscle, without the simultaneous action of great violence, could never draw back the ligaments of the acromial process, which must be broken ere this dislocation can happen. When the projection is low, slight, as Dr. Asstley Cooper has sometimes noticed, the circumstances indicate that the inferior ligament is not ruptured. — (On Dislocations, p. 245.) Falls on the top of the shoulder, a projection of the end of the clavicle under the acromion over the trapezius, and a depression of the shoulder, are symptoms indicating what has happened. The patient also inclines his head to the affected side, and avoids moving his arm or shoulder.

This dislocation is reduced by carrying the shoulder outwards, putting a thick cushion in the axilla, and applying Demme's bandage for fracture of the clavicle (see Fractures) making the turns extend from the clavicle to the axilla, so as to press the lateral end of the bone downwards and keep it in its due situation, at the same time that the elbow is confined close to the side, and supported in a sling, by which means the clavicle will be kept raised and inclined outwards. This plan, which is advised by Boyer, is more efficient than the common practice, which consists in applying a compress to the clavicle of 5 bandages, and supporting the arm in a sling. However, the exact quadrature of the reduction, by any apparatus whatever, is found to be a matter of the greatest difficulty, and some might doubtfully say, impossible; though it is advisable to know that notwithstanding this great obstacle, the use of the last returns very well. In the course of any time, there may several cases in proof of this statement, and one example was shown me by Mr. Bland, St. Vincent, in St. Bartholomew's Hospital. The same observations are applicable to fractures of the sternal end of the bone.

(Dr. James Cooke, of Baltimore, has reported in vol. 4, of the *Ann-Yet Med. and Phil-Journ.* the successful reduction of a dislocation of the clavicle at its superior articulation. — *Revue*.)

PROJECTIONS OF THE CLAVICLE.

Nature, which varies according to the construction of different artists, the nature of their joints, has also been prudent enough to vary the structure of these joints, according to the use of the different portions of their members. To great roundness, some give considerable solidity; for instance, the vertebra column. Others are very strong, but only consist of a slight yielding mass, as we observe in the margin, tibia, &c. Lastly, other joints consist of a great latitude of motion; but their strength is mostly supported by the action of external bodies. Such are in man the shoulder-joint, and that between the sternum and clavicle.

The last kinds of articulation are particularly subject to dislocation, and, of all, not one is so often limited as the shoulder-joint. Highly sensible, that it appears from a comparison, that at some years, this accident at the Hôpital-Neurologique has been so frequent, and even more so than dislocations of all the other bones taken collectively.

Here every thing seems to facilitate the escape of the bone from its natural cavity. An oval shallow cavity, surrounded by a margin of little thickness, receives a semi-spherical head, which is twice as broad as the cavity in the perpendicular direction, and three times as extensive from before backwards. With respect to the ligaments, the joint is only strengthened by a mere capsule, which is thin below, seems yielding against a dislocation; but thicker above, where the acromion, covered process and triangular ligament form an almost insurmountable obstacle to such an accident. With regard to the muscles and tendons of this joint, strong and numerous fasciculi surround the articular surfaces, make them easily move in all directions, well, pushing the head of the os humeri against the different points of the capsule, distal the ligamentous bag; and when their power exceeds the resistance actually formed by it. As for external bodies, when bone is more exposed than the os humeri to the effect of their force?

Thus subjected to the influence of those prodigious forces, the os humeri would be in continual danger of being dislocated, if the scapula, which is as movable as itself, did not furnish a point of support for it, by

displacement, all is resolved. This point of support accommodates itself to the variations in the position of the head of the bone, so that in the movable case of the articular surfaces their strength is in a great measure saving.

The shoulder-joint, which is very liable to luxations or a general strain, is not usually so at all points. There are some, where a dislocation cannot occur; there are others, where, though possible, such an accident has never been observed.

During violent dislocations of the humerus into positions, which are the causes of several tendons, and into positions, which induce the first by the influence of causes previously to be explained. In order to supply the compressions of the various directions in which the head of the humerus is luxated, it is supposed not getting entirely to be located by their limit; one representing its upper edge, another its lower; a third its inner, and a fourth its external one.

The head of the humerus cannot be displaced towards the upper side. Here are situated the acromion and coracoclavicular process, the triangular ligament stretched between them, the tendons of the triceps, supraspinatus, and the fleshy portion of the deltoid, inseparable articulations to the insertion of the head of the bone, prevented by my three apophyses. Besides, what power could dislocate? Supposing there were such a force, the head of the bone must necessarily be driven upwards as well as upwards, so its head would be displaced. This is impossible, because the trunk prevents the lower part of the arm from being dislocated sufficiently upwards to produce this effect.

On the contrary, at the other margin there is difference. At the inferior one, the long portion of the triceps; at the superior one, the tendons of the subscapularis; and at the external edge, those of the infraspinatus and teres minor, will resist any power directed against them, and allow primitive luxations to take place downwards, upwards, or backwards. Downwards, between the heads of the long portion of the triceps and the tendon of the subscapularis, which last, in a case described by Sir A. Cooper, was ruptured (*Ann. Anat.*, part 1, p. 1, and in *Willis's anat.*, 421, 422), upwards between the long subscapularis and tendon of the teres minor, afterwards between the long subscapularis and infraspinatus muscle.

According to Sir Astley Cooper, the os humeri is liable to be thrown from the socket in any of the six positions of four directions: three of these positions are complete; the other is only partial. The first is downwards and forwards, the dislocation runs the acromion, as it is usually called, is upon the head of the bone rests upon the inner side of the inferior cost of the scapula. The second is forwards and the process of acromion, the head of the bone being placed below the middle of the coracoid, and on the external side of the coracoclavicular process. The third is the dislocation backwards, in which the head of the bone can be plainly felt and seen as a protuberance at the back and outer part of the inferior costa of the scapula, upon the dorsum of this bone. The fourth which is only partial, is when the head of the coracoid ligament is torn, and the head of the bone goes against the outer side of the coracoclavicular process. "Of the dislocation in the axilla (says Sir Astley Cooper), I have seen a multitude of instances, of that forwards on the inner side of the coracoclavicular process; although it is much less frequent than that in the axilla: of the dislocation backwards, I have seen only two instances during the practice of my profession for 25 years." (*On Dislocations*, 4th ed. p. 416.)

Sometimes, after the head of the bone has been raised from the articular or pappus part of the capsule, it is carried behind the clavicle, forward a case of "complete dislocation upwards," a species of which was first described by Desault's system. But how the second dislocation only takes place slowly, and when any displacement can hardly be effected, an accident of the axilla allows one constrained by the surface of the bone. Thus is the whorl of the bone, a new variety was formed behind the clavicle, and the humerus adhered by new ligaments to the surrounding parts.

The action of external bodies directed against the arm, but particularly fire, in which this part is fixed against a resisting body, produces a primitive dis-

location, and then the different species of the accident are determined by the particular position of the humerus at the instant when the injury takes place.

Should this bone be directed from the side without being carried either forwards or backwards; should the arm be elevated and the full take place in the side, above the weight of the trunk, almost entirely supported by the bone, forces downwards its upper part, which by this force, forces downwards the upper part of the capsule ligament. Thus a luxation downwards is produced, and this movement may also be facilitated by the continued action of the triceps muscle, particularly upon the triceps muscle, which, as before has just been mentioned, for being at this period invariably strained to support the trunk, they act with the power of a considerable lever; the resistance being the head of the bone, which they draw downwards, with the front part is the lower end of the bone, which is against the ground. Some authors also consider, as the immediate cause of a dislocation downwards, the strong action of the deltoid, which is supposed to strain the head of the bone, and push it downwards through the capsule ligament. In support of this opinion, Billard mentions the well-known case of a woman who dislocated her humerus downwards in lifting up a mirror.

The tendons of the primitive luxation upwards have very little force that of the preceding ones. The elbow is kept separated from the side and internal to the wrist; in falling, the weight of the arm and its humerus, the front part of the capsule is torn, and a luxation takes place in this direction.

The dislocation upwards, as Sir Astley Cooper calls it, backwards is produced in two main parts of way. The elbow is carried forwards towards the upper side; the capsule is stretched upwards, and if a sufficient force act on the head, it is forced out from under the acromion bone. In a full, an arm being pushed against the trunk and kept from, must move sufficiently enough to give such a motion. Hence a luxation upwards, or rather backwards, with the side of the scapula, head, necessarily be necessarily rare, and Desault, in all his expressions, never saw such an accident. Besides, when a full arm is raised from the side and directed forwards in backwards, the weight of the body only operates upon it obliquely, and the head is very little exposed to the action of the triceps muscle, posterior margin, and teres minor muscle. However, a few instances of a dislocation of the head of the humerus in this direction have been recorded. Sir Astley Cooper, in the course of 25 years had met with two examples. In a first subject, Desault remarked a singular inclination of the dislocated arm backwards, its arm was without the presenting on the side an extraordinary elongation and the humerus really slipping under the side of the scapula. (*Précis de Med.*, 4th ed. t. 4, p. 126.)

In the young whose history was published by M. Pons, and in whom a dislocation of the humerus upwards and backwards was seen both by that gentleman and Boyer, there was also the particularity that the humerus was really separated. (*Journal de Med.*, par Cuvier, &c. t. 10, p. 280.) Hence Boyer suspects that this very rare kind of displacement may have been facilitated by some preternatural disposition of the articular surfaces, especially that of the glenoid cavity. No dislocation must occur more frequently than that downwards, in which the influence of the weight of the body, and of the triceps muscle, the acromion, is direct. However, the luxation upwards, or, as Sir Astley Cooper and others call it, backwards, is common.

In all primitive dislocations from violence and not from paralysis of the deltoid, and a gradual yielding of the capsule, I believe the latter part always necessarily loosened. In general authors have paid the little attention to this circumstance, which anatomists have repeatedly demonstrated. Desault had two specimens made of wax; one of a dislocation upwards, the other of one downwards; both of which were cut with in subjects who died at the Hôtel-Dieu. Billard has taken notice of similar facts, and another French surgeon, says, Billard, has observed the same circumstance. I express Billard here should be M. Trucsson, who long ago noticed the location of the humerus, and particularly noticed the attention of surgeons to the subject. (*Ann. Med.*, 6th ed. and 7th ed.)

Desault observes that the capsule may be sufficiently torn to let the head of the bone escape, in

that the opening goes afterward forms a kind of contraction round the neck of the humerus, so as to prevent the return of the head of the bone into the place which it originally occupied. The contraction of this membrane, however, is powerfully denied by Mr. A. Cooper, who remarks, that they who entertain this belief must forget the plastic structure of the capsular ligament, and never witnessed by dissection these extensive lacerations which it suffers in dislocations from violence.—(*Surgical Essays*, part 1, p. 18.)

Several causes may lead to a spontaneous dislocation. If a fresh fall happens while the arm is extended from the trunk, the head of the humerus, which remains confined above, with the utmost facility, the power assuming it in this manner, and is again pushed out of its situation which it accidentally occupies.

A man, going down stairs, meets with a fall, and dislocates the humerus downwards; he immediately sends for Desault, who orders the reduction on the evening. At the next time, the patient, on getting upon a chair, slips and falls again. The pain was never better than when the first accident occurred, and Desault, on being called, instead of finding the head of the humerus as it was in the morning, in the bottom of the axilla, finds it behind the posterior axillary muscle.

The action of motion is a permanent cause of a new dislocation. When the humerus is directed downwards, the posterior margin and the distal end of the upper part of the bone expand and separate, which, only making a weak resistance in their action, changes its position, and takes one in the above axillary direction.

The various motions imparted to the arm just also produce the same effect, according to their direction. Thus, in consequence of painful efforts to reduce the bone, a luxation upwards frequently occurs, or downwards. By the French surgeons, a great deal of our practice has been attached to the division of dislocations of the humerus into primary and consecutive, and perhaps some of their statements of the secondary change in the position of the head of the bone may be exaggerated. That a subsequent alteration in the position of the bone may happen from the causes specified by Desault, are hardly to be questioned. The observations of Petit, Hey, and others, confirm the fact; and I have myself seen a dislocation in the axilla change into one forwards, under the postural regimen. However, Mr. Astley Cooper believes that, excepting from violence and the effect of absorption, the nature and direction of a dislocation are never changed, after the muscles have been contracted.—(*On Dislocations*, p. 416.) Perhaps, with the latter qualification, no great difference prevails between him and other writers.

SYMPTOMS.

In general, the symptoms of dislocations of the humerus are attended with no difficulty.

Whatever may be the mode and situation of the dislocation, there always exists, as Hippocrates has assumed, a marked depression under the axilla, which forms a more evident projection than in the natural state. Almost all the contents of the arca are pulled; some extent is performed in any degree, and they all very loose. The articular surface without the shoulder moving also, because the approximation being no longer able to exercise its function, such it and the shoulder joint, as it were, one body. When the limb is moved, a slight rigidity may sometimes be felt, probably as consequence of the synovia having escaped through the laceration of the capsule.—(*A. Cooper on Dislocations*, p. 415.)

In these symptoms, generally characteristic of every sort of dislocation of the humerus, are to be added such as are peculiar to each particular case. When the luxation is backwards, the arm is a little longer than at the natural state; the natural position of the shoulder is lost in consequence of the oblique line being driven down with the head of the bone; and the patient cannot use the arm. The arm is much or less removed from the axis of the body by the action of the deltoid, the long head of the biceps and supraspinatus muscles being thus directed, and tending to draw the bone posteriorly. The pain which arises from these positions compels the patient to lean towards the dislocated limb, to keep the forearm bent, and the elbow supported on his hip, in such a way that the

arm, having a resting-place, may be sheltered from all painful motion, especially that of the elbow towards the posterior above. Desault often recognized the accident. The head of the humerus may be felt in the axilla; but "only when the elbow is considerably removed from the side."—(*See A. Cooper on Dislocations*, p. 417.) This last circumstance is worthy of particular notice, as the necessity to find the head of the bone limited to mistakes.

With the general symptoms of dislocations of the humerus, a peculiar circumstance is the following: the elbow, separated from the axis of the body, is inclined a little backwards; the humerus seems to be directed forwards in the middle of the clavicle; motion backwards is not very painful, but that forwards is infinitely so; a marked protrusion under the great pectoral muscle; the arm is used by Desault to be a very little longer than in the natural state: by Mr. Astley Cooper it is compared as being somewhat shortened (*On Dislocations*, p. 420), and the profile is the same as in the foregoing case. The corresponding is on the inner side of the humeral bone.

Were a dislocation thus made to prevent itself, it would be peculiarly characterized by a hard tumor under the spine of the scapula; by the direction of the elbow forwards; and by the somewhat increased length of the arm. The motion of the arm would be impaired, but not so great a degree as in the foregoing cases. In the example, related by Mr. Testace, of Hadeney, the arm could be moved considerably either upwards or downwards; but motion forwards or backwards was very limited. And from the observations of Mr. Coles, of Bridgwater, it almost seems that this dislocation may be attended with the peculiarity of the arm being given to the side.—(*A. Cooper on Dislocations*, p. 441—442.)

Many authors, particularly H. Bell, speak of an extraordinary swelling of the whole upper extremity as a frequent consequence of a dislocation humeri. In the time of Hesselius and Richter, these symptoms were not only noticed at the Jussieu, except in very old luxations, and when it was, very beneficial effects were obtained, in certain instances, by applying, for a few days, a moderately tight bandage from the fingers up to the axilla. Richter notices a case in which the arm did not disappear with the cause, but even rather increased; but the dry adhesive bandage had been applied, the swelling was found diminished by touch. Considerable swelling, which sometimes takes place very rapidly, may render the nature of the accident too obscure for a practitioner perfectly unacquainted with all its signs to detect it with certainty; and hence the patient may not have the benefit of right treatment in due time; the bone at length cannot be reduced; a permanently crippled state of the arm is the consequence; the surgeon is used for heavy damages; and his reputation and prospects are ruined.

There is another consequence, to which authors have paid but little attention, though it was known to Aretæus, and was several times observed by Desault. This is a palsy of the upper extremity, arising from the pressure made by the head of the bone, when dislocated upwards, upon the solitary plexus of nerves, and sometimes resulting every means of relief.

Indeed, when the nerves have been long compressed, the affection is very difficult to cure. Desault several times applied the issue above the clavicula. The success which he at first experienced in some patients did not invariably follow in others. But when the head of the humerus has only made, as it were, a momentary pressure on the nerves, and the reduction has been effected soon after the appearance of the symptoms, the paralytic affection often goes off of itself, and its disappearance is powerfully promoted by the use of suitable blisters.

OF THE REDUCTION.

We may refer to two general classes the infinitely various states of malice required for the reduction of a dislocated humerus. The first are designed to push back, by some kind of mechanical force, the head of the bone into the cavity from which it is disengaged, either with or without making previous extension. The others are merely intended to change the head of the bone from the place which it accidentally occupies, leaving it to be put into its natural situation by the action of the muscles.

By the first means we effect every thing; by the second, it limits the interference to the extensile line.

tion of the powers of nature. In the first method, the force externally applied always operates on the bone in the direction of two powers, which resist each other at a more or less acute angle; in the last the power is only in one direction.

All the means intended to operate in the first way, act nearly in the following manner. Something placed under the axilla serves as a fulcrum, on which the arm is moved as a lever, the resistance being produced by the dislocated head of the humerus, which the power is applied either to the lower part of this bone, or the wrist. The muscles of the humerus being pushed downwards and forwards, the ligament of the bone is necessarily moved in the opposite direction, towards the glenoid cavity, into which it slips with ease or less facility.

These operated the machine in celebrated among the ancients and moderns, under the name of the *crucis* of Hippocrates; whether used exactly in the form described by him, or with the numerous variations devised by Paul of Aegina, Astruc, Paré, Deschamps, Frey, &c. It has sometimes a double motion is ascertained to the head of the humerus, as above explained.

The extension usually moves the bone from its natural situation, and is executed in different ways. Sometimes the weight of the body on one side, and the dragging of the end of the dislocation band on the other, tend to produce this effect. Such was the action of the ladder, described in Hippocrates's *Traité des Fractures*, and repeated in modern works. Sometimes the trunk is fixed in an inextensible manner, while the arm is powerfully extended, as is practised in employing the machine of Orsinius, one of the apparatus formerly adapted to the public place where wheelers conducted.

Sometimes no extension is actually executed, and while the end of the humerus is pushed upwards by a body placed under the axilla, the surgeon pushes it upwards into the glenoid cavity.

The following are the elements common to all these contrivances.

However well covered the body placed under the axilla may be to serve as a fulcrum, there is always a more or less considerable chafe, frequently dreadful stretching and laceration of parts in consequence of its application, when the trunk is suspended upon it, as in the instance of the ladder, &c. In this way Paul saw a fracture of the neck of the humerus produced, and even a laceration and amputation of the axillary artery.

Few surgeons have the different kinds of apparatus at hand. Hence trouble and loss of time in getting them; time, which is of so much moment, so the probability is always great that the success is compromised.

When the humerus is coarctated, how can medical means bring back the head of the bone through the track it has taken? For instance, if it is dislocated downwards and towards the axilla, the head of the bone ought to be brought down before it can be replaced. The above means which do not cooperate with the nature, which are the chief and essential agents in the reduction.

Perhaps, however, they might be advantageously employed, when a primitive fracture downwards is quite recent, and when the head of the bone is very near the cavity. Then the inferior end of the scapula presents an inclined plane, along which the end of the bone naturally glides, when propelled by any kind of external force.

Boissier very often employed the following method with great success. While the patient was seated upon a chair of moderate height, he took hold of the hand on the affected side, placed it between his knees, which he moved downwards and backwards, in order to make the extension and draw the head of the bone, while an assistant and back the trunk in order to counter-extension. This was sometimes executed by the weight of the body and effort of the patient. At the same time the surgeon's hands, being applied to the arm in such a way that the first finger of each was put in the hollow of the axilla, and the thumb on the outer part of the arm, pushed upwards, and a little outwards, the head of the humerus, which usually detached with ease into its natural cavity.

Peix describes this plan, but complicated with the use of a cushion, passed under the patient's axilla, and over the surgeon's neck, who contributed to raise the elevated end of the bone, by lifting up his head.

When the fracture downwards was very recent, Boissier successfully reduced it by a still more simple process. Marie-Louise Favre left in going down stairs, dislocated her arm down a wall, and was conveyed immediately after the accident to the Hôtel-Dieu. Boissier having recognised the dislocation, placed his left hand under the axilla, to serve as a fulcrum, while with the right, he pushed the lower end of the arm, to depress the humerus towards the trunk, and at the same time raised the upper part of the bone. The head of the humerus, directed upwards and laterally, immediately returned into its natural cavity, without the least resistance.

Reduction by means of the surgeon's hand is the patient's axilla is a well-known method, which is recommended by Mr Ashley Cooper as the best in three-fourths of recent dislocations. The patient (the observer) should be placed in the recumbent position, upon a table or a sofa, and near the edge. The surgeon then takes a seated position round the arm, immediately above the elbow, upon which he ties a handkerchief. Then, with one foot resting upon the foot, he separates the patient's elbow from his side, and places the foot of the other foot in the axilla. The arm is then slowly drawn with the handkerchief for three or four inches, as the extent which the loose in common cases is easily displaced. If more force be required, a long towel may be tied, with which several persons may pull. Mr Ashley Cooper generally holds the forearm nearly in a right angle with the os humeri, because this position relaxes the ligaments, and lessens the resistance. In many cases, however, he makes the extension at the elbow, a plan in which he finds more force required, but the hindrance is less apt to stop.

Another simple mode of reduction, which Mr Ashley Cooper considers proper for recent dislocations, dislocations, and very old, reduced, unacted persons, is this by means of the surgeon's knee, and fulcrum, is the patient's axilla. The patient is placed on a low stool, on the side of which the surgeon rests his feet, while he takes hold of the os humeri just above the condyles, and applies his knee hard to the os humeri. The arm is then drawn down over the knee, and the head of the bone returns almost easily.—(See Dislocation, p. 421.)

In some cases the preceding methods are inadequate, and greater extension must be made. The following was the practice of Boissier.

The patient seated upon a table covered with a wet towel, a thick linen wrapping is applied to the axilla, on the side affected, and upon this a compress the middle of the free extending bandage is placed, the two ends of which extend obliquely before and behind the elbow, meet each other at the top of the scapular shoulder, and are held there by an assistant, so as to fix the trunk and make the counter-extension. The action of this bandage does not affect the margin of the particular injury and laceration done, in consequence of the pad pressing over them. If this were not attended to, these muscles, being drawn upwards, would pull the humerus in this direction, and thus destroy the effect of the extension, which is to be made in the following manner.

Two assistants take hold of the forearm, above the wrist; or else the towel, distant several inches, if it be applied to this part. The two cranks are to be kept together, and held by one or two assistants, who go to begin pulling in the same direction in which the bone is to be moved. After this first proceeding, which is designed to disengage the head of the bone from its condensed situation, another motion is to be employed, which differs according to the kind of fracture. If the elbow be downwards, the arm is to be gradually brought over the trunk, at the same time that it is gently pushed upwards. Thus the head of the bone being separated from the trunk, and brought near the glenoid cavity, must glide into this situation with great little resistance.

When the fracture is forwards, after the extension has been made in the direction of the humerus, a towel of this kind should be rolled upwards and forwards, in order that the head may be guided backwards, and into its seat, while the traction is continued.

When the head of the bone has been disengaged by the first extension, the motion required to put it in the rest of the extension, should in general be exactly contrary to the course which the head of the bone has taken after getting the glenoid cavity. When there is difficulty experienced in replacing the head of the bone, one should, after making the extension, move the limb about in various positions, according to the different

direction of the dislocation, and the possible joint used. This plan often accomplishes what extension alone cannot; and the head of the bone, brought by such movements towards its cavity, retains also its position during its reduction.

When the dislocation is spontaneous, it is the first extension made in the direction of the displaced bone, which brings back its head to the situation where it was previously lodged, and the case is then to be managed just as if it were a traumatic dislocation.

Thus we see that, except in a few cases, where the beneficial operation of the muscles has been prevented by the violence of the dislocation or by adhesions, and where it was necessary to employ means to force, as it were, the head of the bone into its cavity, to which the muscles could not bring it, almost any employed will spontaneously dislocate till he has put the muscles in a state favorable for accomplishing reduction.

When the muscles are very powerful, or the displacement has continued several days, Sir Astley Cooper, instead of the treatment by the head in the axilla, recommends the patient to be put upon a chair, and the scapula to be fixed by means of a bandage which allows the arm to pass through it, and is buckled on the top of the scapula, so that it cannot slide downwards. A wetted roller is then applied round the arm just above the elbow, and over the roller a strong wooden tape, fixed with what the sailors term the elevated knot. The arm should now be raised to a right angle with the body, and if much difficulty be experienced, even above the horizontal line, it is better to raise more gradually the distal and suprapatellar muscles. Two persons are then to pull the wetted tape, and two the scapula bandage, in opposite directions, with a steady, equal, and continued force. After the extension has been kept up a few minutes, the surgeon is to place his knee in the axilla, with his feet resting upon the patient's chair; he now raises his knee, while he pushes the scapula downwards and forwards, and the head of the bone nearly slips and the glenoid cavity. Sometimes Sir Astley Cooper has seen a protractor motion of the limb made during the extension, just about the reduction.

In old cases, and others attended with great difficulty, from the powerful contraction of the muscles, Sir Astley prefers making the extension with pulleys, because with them, when the resistance is likely to be long, safe and unaltered force is more likely to be avoided than in the preceding method of reduction; and the muscles less apt to be fatigued. The patient sits between two stools, which are secured into the sides of the room; the bandages are then applied precisely in the same way as when the extension is made without pulleys; and the force is applied in the same direction. The surgeon is to pull the cord of the pulley gently and steadily till pain is complained of, when he is to resist the extension already made, but as soon as it. During this time, he should converse with the patient, and direct his mind in other matters. In two or three minutes, more force should be applied, and very gently increased, until pain be again complained of, when another stop should be made. The surgeon should proceed in this way for a quarter of an hour, at intervals slightly raising the limb. When the extension seems great enough, an assistant should hold the cord of the pulley, and keep up the degree of extension, while the surgeon puts his knee into the axilla, and having thrust upon the chair, gently raises and pushes back the head of the bone towards the glenoid cavity, into which it generally returns without the strap needing being when the reduction is effected in other cases. Sir Astley Cooper prescribes the use of the pulleys with extension, the warm bath, and a great deal of continued easy exercise, until relaxation is produced, and why he refers to our general remarks.—(On Dislocations, p. 429.)

When the head of the humerus is dislocated forwards, or under the axilla or the clavicle, Sir Astley Cooper recommends the limbs to be relaxed, and the extension to be made collaterally backwards, and a little backwards. In some instances of this kind, he says, the pain of reduction by means of the head in the axilla will abate, then being taken to apply the force rather more forwards than in a dislocation into the axilla, so that it may press on the head of the bone. However, when the dislocation has continued several days, the resistance greatly increases with pulleys necessary.

As soon as the head of the bone has been drawn below the level of the coracoid process, it is to be pressed backwards with the surgeon's hand or knee, and the elbow at the same moment pulled forwards.—(Op. cit. p. 429.)

The dislocation on the dorsum of the scapula appears, from some cases in Sir Astley Cooper's work, to be reducible by nearly the same mode of extension as has been proposed for the reduction of the dislocation in the axilla. Mr. Coley, of Bridgwater, who has met with two cases of luxation backwards, advises the reduction to be effected by elevating the arm and holding it vertically, so as to roll the head of the humerus towards the axilla, when it is to be kept in this position, while the arm is brought down into a horizontal direction; on the extending force being now relaxed, the bone is easily reduced.—(Op. cit. p. 434.)

In the partial dislocation forwards, or that where the head of the bone lies at the scapular side of the coracoid process, the mode of reduction, according to Sir Astley Cooper, is the same as that employed in the complete dislocation forwards; but it is necessary to draw the shoulders backwards, and as soon as the reduction is accomplished, the bone is to be kept from slipping forwards again by maintaining the shoulders at that position with a bandage.—(Op. cit. p. 435.) The elbow and forearm should also be supported as much forwards as possible in a sling.

In the fracture of St. Thomas's Hospital is a preparation, exhibiting a dislocation of the humerus into the axilla, complicated with a separation of the greater tuberosity by fracture. In Sir Astley Cooper's valuable work on this subject he also recorded a case of compound dislocation of the humerus, which was under the care of Messrs. Blizard and Ingham, of Newcastle, and was cured by amputation.—(P. 435.) Both these accidents must be treated on the same principles as other severe compound dislocations.

For the purpose of preventing the head of the bone from slipping out of its place again, the arm should be kept for some days after the elbow bandaged close to the side, and supported in a sling. Sir Astley Cooper recommends a cushion to be put in the axilla, and a scapular bandage and sling to be applied.—(On Dislocations, p. 435.) After the reduction of a dislocation which has happened downwards, the facility of a fresh displacement is said to depend very much upon the extent to which the tendon of the subscapular muscle has been lacerated.—(A. Cooper's Surgical Essays, part I, p. 7.)

OF SOME CIRCUMSTANCES RESPECTING THE REDUCTION OF THE DISLOCATION OF THE HUMERUS.

1. Necessity of the Opening of the Capsule.

While Desault considers this circumstance as one of the chief impediments to the return of the head of the humerus into the glenoid cavity, Pott and Sir Astley Cooper are of opinion that the capsular ligament can never cross any such difficulty. According to Desault, the surgeon indicated is to enlarge various openings by inserting his fingers. This is fulfilled by moving the limb about freely in every direction, particularly in that in which the dislocation has taken place. Now by pushing the head of the bone against the capsule already torn, the latter becomes lacerated still more, in consequence of being pressed between two hard bodies. The reduction, which is frequently impracticable before this maneuver, often spontaneously follows immediately after it has been adopted. In the Journal de Chirurgie are two cases, by Astruc and Parthous, establishing this doctrine.

Mr. C. White, of Manchester, also believed that the reduction was sometimes prevented by the head of the bone not being able to get through the laceration in the capsule again. He succeeded in reducing some cases which he supposed to be of this nature, in the following manner: having screwed an iron ring into a beam at the top of the patient's room, he fixed one end of the pulleys to it, and inserted the other to the dislocated arm by ligatures attached to the wrist, placing the arm in an erect position. In this way, he drew up the patient till his whole body was suspended; but that too much force might not be sustained by the wrist, Mr. White at the same time directed two other persons to support the arm above the elbow. He now tried to force with his hands to conduct the arm into its place, if the reduction had not already happened, as was some-

dislocation of the humerus—(*Minerva Chirurgica*, Milan, v. 2, p. 446-447.)

DISLOCATION OF THE HUMERUS FROM THE SCAPULA.

Scarcely has the extent of the articular surfaces of the radius and ulna, the strength of the tendons and ligaments surrounding the joint, and the natural position of the bone extension, rendering the articulation a perfect angular synsarcosis, a dislocation of both the radius and ulna from the humerus, is an accident for which a surgeon is sometimes consulted. The radius and ulna are most frequently lacerated backwards; sometimes anteriorly, but very rarely forwards: the latter situation cannot always constitute a fracture of the os humeri. Indeed, it is so uncommon, that neither Pott nor Desault ever saw it with it. The fracture backwards is dictated by the great size of the coracoid process, which, when the humerus is forcibly pushed downwards and forwards, may slip behind it, and ascend as high as the cavity which receives the olecranon in the extended state of the humerus.

Mr. Astley Cooper's experience has taught him to guard with care the different ligaments of the elbow:—1. That of the rotator and ulna backwards. 2. That of both these bones laterally. 3. That of the ulna alone. 4. That of the radius alone forwards. 5. That of the radius backwards.—(*On Dislocations*, p. 485.)

In the fracture backwards, the radius and ulna are several times or less behind the humerus; but the posterior process of the ulna is always extruded above the articular surface, and is forced lodged in the cavity destined to receive the olecranon. The head of the radius is placed behind and above the external condyle of the humerus. The articular ligament, which confines the superior extremity of the radius to the ulna, may be lacerated: in which case, even when the bones are reduced, it is difficult to keep them in their proper places, as the radius tends constantly to quit the ulna.

This accident always takes place from a fall on the hand; for when we are falling, we are led by a mechanical instinct to bring our hands forwards to protect the body. If, in this case, the vapour extremely, instead of resting vertically on the ground, be placed obliquely with the handward in a side of extension, the vapour which is received from the ground will cause the two bones of the forearm to ascend behind the humerus, while the weight of the body pressing on the humerus, directed obliquely downwards, serves as a counterweight to press down before the extended process of the ulna.

The humerus is in a state of half flexion, and every attempt to extend it produces acute pain. The extension of the olecranon, with respect to the condyles of the humerus, is changed. The olecranon, which, in the natural state, is placed on a level with the external condyle, which is itself situated lower than the internal, is even higher than the latter. Posteriorly a considerable protrusion is formed by the ulna and radius. On each side of the olecranon, a swelling appears. A considerable hard swelling is felt on the free part of the joint, arising from the rupture of the lower end of the humerus. The local and general are severe, and the power of bending the joint is in a great measure lost.—(*Mr. Astley Cooper on Dislocations*, p. 486.)

The swelling, which supervenes in twenty-four hours after the accident, renders the ligaments more difficult; but, notwithstanding the assertion of Bayle, I believe the olecranon and internal condyle are never so distended that the distance between them cannot be fully increased. It is true that the rubbing of the constantly present and diverging angles, the humerus may cause a grinding noise, similar to that of a firestone; and some attention is certainly required to establish a dislocation between a fracture of the head of the radius and a dislocation of the humerus backwards. "This dislocation," says Mr. Astley Cooper, "is at first sometimes undetected, in consequence of the great inflammation, which immediately succeeds the injury; but this circumstance does not prevent the reduction, even at the period of several weeks after the accident; nor I have known it thus reduced by bending the limb over the knee, even without great violence being employed."—(*On Dislocations*, p. 478.)

A laceration backwards must be attended with serious injury of the surrounding soft parts. The lateral ligaments are necessarily ruptured, and sometimes the an-

terior ligament of the radius. In a case directed by Mr. Astley Cooper the articular ligament was entire. The biceps muscle was only slightly cut upon the stretch; but the brachialis was extensively so. Probably the lower insertion of the biceps and brachialis internus would likewise be more frequently lacerated by the violent protrusion of the head of the humerus forwards, were it not that only attachments are in some distance from the joint. This accident, however, occasionally takes place, and then the humerus is observed to be freely placed in any position; and not to retain one attitude, as is generally the case in dislocations. The lower end of the humerus, indeed, has been known not only to lacerate these tendons, but to burst the integuments and project itself externally; an instance of which is recorded by Pott, and two years since I saw myself, during my apprenticeship in St. Bartholomew's. Before partly remarking, that it is difficult to operate here, either these circumstances, that brachial artery had broken some short time. In fact, this vessel has sometimes been ruptured, and sometimes of the loss of the contraindication; but this injury of the artery, and the laceration of the tendons and skin, are uncommon.—(*Journal des Med. Chir.* t. 1, p. 515.) Nor if the artery were wounded, would gangrene be necessarily the result; for if my memory is correct, an instance in which the skin was torn, notwithstanding such a complication, is mentioned by Mr. Abernethy in the lecture, though all would the risk would be great.

The following method of reducing the elbow is advised by Boyer:—The patient being seated, an assistant is to take hold of the middle of the humerus, and make counter-extension, while another assistant makes extension active way. The surgeon, seated on the extension, grasps the elbow with his two hands, by applying the forefingers of each to the anterior part of the humerus, and the thumbs to the posterior, with which he presses on the olecranon, in a direction downwards and forwards. This method will possibly be successful if the strength of the patient, or the force continued of the olecranon, render it necessary to employ a greater force, extension is to be made with a truss applied on the wrist, and a truss is to be placed on the upper arm, and the arm must break and as a case of cases of fracture of the humerus.

In Mr. Astley Cooper's method, the patient sits in a chair. The surgeon places his knee on the inner side of the elbow-joint in the bend of the arm, and taking hold of the patient's wrist, bends the arm. As the same time he presses on the radius and ulna with his knee, so as to separate them from the os humeri. Thus the rounded process is pushed out of the posterior fossa of the humerus; and while the pressure is kept up with the knee, the arm is to be flexed gradually, and the reduction is soon effected. According to the same authority, the olecranon may also be reduced by bending the arm over a bedpost, or by bending it while it is clamped in the opening of the back of the elbow-chair in which the patient sits.—(*On Dislocations*, p. 484.)

A bandage may afterward be applied in the form of a figure of 8, encompassing both arm and the arm kept in a sling. The swelling which follows is to be subdued by antiphlogistic means.

At the end of seven or eight days, when the inflammation has subsided, the ambulatory is to be gently moved, and the motion is to be increased every day, in order to prevent an ankylosis, to which there is a great tendency.

In this dislocation, the articular ligament which confines the head of the radius to the extremity of the ulna is sometimes torn, and the radius passes in front of the olecranon. In such cases, penetration and expansion are difficult and painful; though the principal fixation has been reduced, the head may be easily replaced by pressing it from before backwards, and it is to be kept in its place by a compress, applied to the superior and external part of the olecranon. The compresses are to be taken off every two or three days, and the joint gently bent and extended, in order to prevent ankylosis.

In a modern publication, an instance of a dislocation of the head of the radius and ulna backwards is related, where the lower end of the humerus protruded through the olecranon, and as it could not be reduced, it was amputated. The patient, a boy, recovered the full use of his arm.—(*Journal, Pract. Chir.* de l'Europe, Compagnie Parisienne, 34, p. 101.)

A luxation forwards should be treated as a fracture of the os humeri, with which it would be inevitably accompanied. Here, as occasion of the great injury done to the soft parts, it would also be right to bleed the patient copiously, and put him on the antiphlogistic regimen.

With respect to lateral luxations, either upwards or downwards, they are always incomplete and easily corrected. In the case upwards, the os humeri remains situated on the back part of the external condyle. The position of the ulna backwards is even greater than if the dislocation of both bones directly backwards, and the radius forms a pyramidal point and is on the outer side of the os humeri. By moving the hand, the rotation of the head of the humerus can be distinctly felt. In the lateral dislocation backwards, the ulna may be driven upon the internal condyle, so as to produce an irregular hollow above it, and the rotation of the head of the os humeri can be distinctly felt. Sometimes when the ulna is driven upon the internal condyle, it still projects backwards, as in the external lateral dislocation, in which circumstance the head of the radius is in the posterior fossa of the humerus, and the entire condyle forms a considerable projection—(A. Cooper, op. cit. p. 471.). Boyer advises the reduction of lateral dislocations to be effected by extending the humerus and forearm, and at the same time pushing the extremity of the humerus and the heads of the ulna and radius in opposite directions.

According to Mr. Astley Cooper, in each of the lateral dislocations, the reduction may be performed by bending the arm over the knee; and in recent cases, as one which he relates, proves, by supposing that the humerus may be more readily disengaged by flexing the arm; he when this is done, the humerus and radius drive the heads of the ulna and radius into their right places again.—(P. 472.)

These luxations cannot be produced without considerable violence; but when the bones are restored, they are easily kept in their place. It will be sufficient to pass a roller round the part, to put the forearm in a middle state, neither much bent nor extended, and to support it in a sling. But useful information is to be rejected from the injury done to the soft parts. Is it to prevent, or at least mitigate it, the patient is to be kept two or three times and put to a low diet, and the articulation is to be covered with the lotus plantain oint, or an emollient poultice. It is scarcely necessary to repeat, that the arm is to be putted as soon as the state of the soft parts will admit of it.—(Boyer, *op. cit.* p. 471.)

A dislocation of the humerus backwards is said to occur less times as frequently as lateral luxations; and those forwards are so rare, that no extension whatever can be drawn.—(Macleod's Clin. & Surg., A. 1.)

All recent instances of the elbow are easily reduced and as easily maintained; for a displacement is prevented by the reciprocal manner in which the articular surfaces receive each other, and by the mutual expansion and contraction. This consideration, however, should not lead us to omit the application of a bandage in the form of a figure 8, and supporting the arm in a sling.

DISLOCATIONS OF THE RADIUS FROM THE ULNA.

The majority of writers on dislocations of the forearm have not separately considered those of the radius. The subject was first well treated of by Desault. However, dislocations of its lower end remained unnoticed until Desault, reviewed the profession with a particular regard to them.

The radius, the movable agent of pronation and supination, with regard to the ulna, which serves its immovable support, by means of two articulations; one above, slightly convex, broad internally, rough externally, and corresponding to the little sigmoid cavity of the ulna, in which it is lodged; the other below, concave, semicircular, and adapted to receive the convex edge of the ulna. Above, there are two points, differing in their motion, articular surfaces, and ligaments.

Above, the radius is pivoted and supported only round its own axis; below, it turns about the axis of the ulna. Here, being more extensive and powerful, than they are above. The head of the radius, turning on between axes in the annular or veterinary ligament,

cannot dislaid in any direction. On the contrary below, the radius, in performing motions, strikes the posterior part of the capsule, and presses it against the immovable head of the ulna, which is apt to be pushed through, if the motion be forced. A similar event, in a contrary direction, takes place in supination. The front part of the capsule being rendered tense, may now be dislaid.

Add to this disposition the difference of strength between the ligaments of the two joints. Below and yielding below; thick and firm above, their difference is very great. The upper head of the radius, supported on the annular immovable articular surface of the ulna, is protected from dislocation as much as its position. On the contrary, as lower end, carrying along with it in its motions the form of the capsule, which it supports, cannot itself derive any solid stability from itself.

From what has been said, the following conclusions may be drawn: 1. That with more causes of motion, the lower articulation of the radius has less means of resistance; and that under the triple consideration of muscles, ligaments lying the articular surfaces together, and the form of these surfaces in each other, this joint must be very subject to dislocation. 2. That, for opposite reasons, the upper joint is very secure, so that, though, be rarely exposed to such an accident. The latter requires more consideration, since it is when the annular ligament of the radius is torn in a fracture of both heads of the radius and also backwards, and particularly causes the returning to a dislocation of the upper head of the radius from the lower sigmoid cavity of the ulna, as a single and unresisted injury, suddenly produced by an external cause, and, therefore, either to be combated with the same above specified, or with other examples in which the displacement happens slowly, especially in children, is consequent on a disease at various states of the ligaments.

However, some instances of dislocation of the upper head of the radius, suddenly produced by external causes, are recorded by Desault; the particulars of another case were communicated to the French Academy of Surgery; and I have been informed of two examples which were met with in this country.

Two of these cases occurred in the practice of Mr. Duane, of Scarborough; one in that of Mr. Lawrence; and the other was attended by Mr. Ellis. Mr. Astley Cooper has himself seen six examples of the dislocation of the head of the radius forwards. Baron Boyer says, that many instances are now known in which the upper head of the radius was dislocated backwards; indeed, in opposition to what Desault insisted, he asserts, that dislocations of the lower joint, between the radius and ulna are more rare than those of the upper joint between the same bones. The latter assertion he has twice seen himself.—(Med. Clin. L. 4, p. 245.)

The dislocation backwards is described by the author, as occurring more readily and frequently in children than in adults or old subjects. The reason of this circumstance is ascribed to the less firmness both of the ligaments and of the condyles three of the extreme articular, which three, in a more advanced age, contribute greatly to strengthen the external ligament. In a child, too, the little sigmoid cavity of the ulna is smaller, and the annular ligament, extending farther round the head of the radius, is longer, and more apt to give way. Hence, is a subject of this description, efforts, which may not at first produce a dislocation, if frequently repeated, cause a gradual elongation of the ligaments, a change in the internal position of the bones, and at length, a degree of displacement as great as in a case of dislocation (marked) and immediately effected.—(Treat. des Mal. Clin. L. 4, p. 245.)

Another fact mentioned by Boyer is, that the inferior surface of the upper head of the radius backwards is always complete, articular surfaces being perfectly separated both from the lower end of the humerus, and from the little sigmoid cavity of the ulna. The usual cause of the accident is a pressure of the forearm, carried with great violence beyond the natural limits.

In a dislocation of the head of the radius backwards, the forearm is bent, and the hand fixed in the state of pronation. Dislocation can neither be performed by the action of the muscles, nor by strength. Here; and

every attempt to separate this movement produces a considerable increase of pain. The head and fingers are moderately bent, and the upper end of the radius may be observed forming a considerable projection behind the lower end of the humerus. In the case which was mentioned to me by my friend Mr. Lawrence, the head of the radius lay upon the outside of the external condyle.

Sir Astley Cooper has given some a dislocation of the upper end of the radius backwards, in the living subject; but a case was brought for dissection this day from St. Thomas's Hospital, which had such a dislocation which had never been reduced. The head of the radius was thrust behind the external condyle, and rather to the outer side of the lower extremity of the humerus. The lower part of the coronary ligament was seen through, as well as the oblique one, and the caputulum was generally luxated.

In the first of case described by Sir Astley Cooper, where it seems the limb was dislocated, this appeared to surprise everyone, that the bone would be easily reduced by bending the arm.

The reduction is to be accomplished by extending the forearm, and endeavouring to bring it into the scapular position at the same time that the supinator acts to press with his thumb the head of the radius forwards towards the lower tubercle of the humerus, and into the little sigmoid cavity of the ulna again. Success is indicated by the patient being now able to perform the supinator motion of the hand, and to bend and extend the elbow with freedom.

For the purpose of preventing a return of the dislocation, and giving others an opportunity of repeating the little experiment, measures must be taken to hinder the protrusion of the head. Boys sometimes do with this view a roller, compresses, and a sling; but it appears to me, that a slight, extending band to the extremity of the fingers, and laid along the spine of the scapula with a pad of sufficient thickness to keep the hand daily elevated, would be right, in addition to the sling, roller, &c.

In the dislocation of the head of the radius forwards, this part is thrust into the hollow above the external condyle, and upon the coronoid process of the ulna. According to Sir Astley Cooper, the forearm is slightly bent, but cannot be bent to a right angle, nor completely extended. When it is moderately bent, the head of the radius strikes against the fore part of the os humeri. The hand is in the prime position, and if raised, the corresponding motion of the head of the radius can be felt at the upper and front part of the elbow-joint. The os coracii or acromion, the oblique ligament, the front of the caputulum, and a portion of the intracapsular ligament, are torn.

Sir Astley says, that the cause of this accident is a fall upon the hand when the arm is extended; at which event, the radius receives the weight of the body, and is forced up by the side of the ulna, and thrown over the external condyle upon the coronoid process. In two of the cases recorded by him, the reduction could not be accomplished; in the third it was effected during a struggle by extending the forearm, while the surgeon rested on the patient's foot. In the fourth, the hand was placed on a wall, and his arm bent over the back of it, in which state continued till he made him bend, without extending the ulna. The left hand of the os humeri, and the reduction was accomplished in a few minutes. The chief things to be observed are, so in the treatment act upon the radius alone, without the ulna, and during the extension to get the hand to extend. (*Practical Surgery*, p. 474-477.) In the latter position the forearm should also be kept by means of a splint, pad, and bandage, until the first pain is healed.

DISLOCATION OF THE LOWER END OF THE RADIUS.

The radius may, I believe, act of the passive and passive motions. Thus, Denham has published the case of a labourer, who dislocated the lower end of the radius forwards, by a powerful pressure of her hand in twisting a wet cloth. (*Hopk. Trans. de Med. Chir.* 1, 4, p. 214.)

2. External force, moving the radius violently into a sudden position, and rupturing the ligament, and breaking the joint.

There are two kinds of dislocation: one of

the radius forwards; the other backwards. The first is very frequent, the second is much less so. The latter case is now mentioned by Sir Astley Cooper, and never presented itself to Denham but once in the dead body of a man, both of whose arms were dislocated, and of whom the particulars could be learned. The head of the ulna was pushed in front of the sigmoid cavity of the radius, and in contact with the os capitulum, in which it was covered by a singular ligament. (*Hopk. Trans. de Med. Chir.* 1, 4, p. 202.) The latter writer has also recorded one instance of this rare accident. (*Phil. ed.* p. 223.)

In the dislocation of the lower end of the radius forwards, described by Sir Astley Cooper, this part is thrust over the front of the caputulum, and lies upon the os acromion and the os coracii.

The positions of the lower end of the radius, described by Denham, are the same as those named by Sir Astley Cooper dislocations of the lower end of the bone from the radius, and differ from the case called by him a fracture of the radius only at the wrist, inasmuch as the hand is not thrown in the opposite direction to that of the radius; but this bone is merely displaced from the os coracii, another surface of the ulna, its limit going along with it. This displacement makes a singular difference in the mode of reduction, with reference to the direction in which the hand is to be pushed. In the location of the lower end of the radius forwards, described by Denham, the apparatus are constant position of the forearm; an inability to perform supination, and great pain on the thing attempted; an unusual position at the back of the fist, in consequence of the protrusion of the little end of the ulna through the sigmoid; the position of the radius is very forward than natural; resistant adhesion of the thumb, which is almost always exposed; a nail long, some of the fingers, and very often of the fingers, which posture cannot be changed without considerable pain. The outer side of the hand is twisted backwards, and the hand forwards. The protrusion rests on the fore part of the wrist by the head of the radius is very evident, and, in Sir Astley Cooper's case, the styloid process of the radius is no longer strained opposite to the os trapezium. This case, he says, usually happens from a fall while the hand is bent back. (*On Dislocations*, p. 503.)

Sometimes the lower end of the radius is driven through the skin at the hands of the wrist, between the radial artery, and the veins formed of the dorsal veins of the wrist and fingers. Cases of this description, when well managed, generally have a favorable termination, as we see in the case reported by M. Thompson. (*Ann. de Med.* p. 204.)

If the situation of the opening in the skin expose its impediment to reduction, the integuments should be divided with a knife.

A fracture of the radius backwards is characterized by symptoms the reverse of those above mentioned. They are, a violent expansion of the limb; inability to put it upon; pain on making the attempt; a tumor in front of the forearm formed by the head of the ulna; a projection backwards of the large head of the radius; and adhesion of the thumb.

When the dislocation is forwards, an assistant is to take hold of the elbow, and raise the arm little from the body; while another is to support the hand and fingers.

The surgeon is to take hold of the end of the forearm, with both his hands; one applied to the inside, the other to the outside, in such a manner that the two thumbs meet each other in front of the limb, between the ulna and radius, while the fingers are applied to the back of the wrist. He is then to endeavour to separate the two bones from each other, pushing the radius backwards and upwards, while the ulna is bent to its proper place. At the same time, the assistant, holding the hand should try to bring it into a state of supination, and consequently the radius, which is its support. Thus pushed, in the direction contrary to that of the dislocation, by two powers, the radius is moved backwards, and the ulna comes into the vicinity of the caputulum, and into the sigmoid cavity.

Sir A. Cooper, who describes how once under the name of a dislocation of the lower end of the radius backwards reduces it by pressing the bone forwards, and maintains the reduction with splints well padded, and a compress of leather over the end of the joint. (*On Dislocations*, p. 492.)

It should present a dislocation of the lower end of the radius back wards, or, in other words, of the lower end of the bone forwards, the axis kind of pressing, situated in the opposite direction, would serve to accomplish the reduction.—See *Chapman's Clin. & Surg.*, p. 10.

In the fracture of the lower end of the radius forwards, upon the supina, Mr. Astley Cooper effects the reduction, by extending the hand, while the forearm is fixed.—(On *Dislocations*, p. 265.)

REDUCTIONS OF THE WRIST.

The carpal bones may be displaced from the lower side of the radius and ulna forwards or backwards. The case backwards is the most frequent. It is facilitated by the direction of the convex articular surfaces of the scaphoid, lunate, and triquetrum bones, which slope more backwards than forwards. According to Mr. Astley Cooper, the direction of the force determines the direction in which the carpal bones are displaced: thus if a person is falling full on his hand to save himself, and fall upon the palm, a dislocation is produced, the radius and ulna are forced forwards upon the scaphoid ligaments, and the carpal bones are thrown backwards. A considerable swelling is produced by the radius and ulna on the fore part of the wrist, and a similar protuberance upon the back of the wrist by the scaphoid, with a depression above it, and the hand is bent back.

When the carpal bones are dislocated forwards under the lower tendons, and the radius and ulna backwards upon the posterior part of the carpus, the accident has been caused by a fall on the back of the hand.

In both of these cases, two swellings are produced; one by the radius and ulna; the other by the bones of the carpus. Sprains will often cause a good swelling over the dorsal tendons, and give rise to the protuberance of a location, from which they may always be known by the swelling being single, and by not having such an appearance directly after the injury.

Dislocations forwards or backwards are never complete. The protuberance of the carpal bones at the inner or outer side of the joint, and the distortion of the hand, make such cases sufficiently evident.

Several dislocations of the wrist, particularly such as are incomplete, are easy of reduction; but when the dislocation has been suffered to continue some time more difficulty is experienced, and in a few days all attempts are generally unavailing. This observation applies to all dislocations of synovial joints; and I cannot, therefore, too strongly caution the student at such a time to dispose the swellings of the soft parts of the bones are exposed; an absurd plan, which, I am sorry to say, is mentioned by Boyer.—(*Mat. Med.*, v. 4, p. 789.)

For the purpose of reducing the dislocated bones, antiseptic powder must be made, while the two surfaces of the joint are made to slide on each other in a direction necessary to what they took when the accident occurred.

In dislocations of the wrist, numerous blisters are always necessary applied, and many leeches employed; consequently, a good deal of swelling generally follows, and the patient is a long time in regaining the power use of the joint. Hence the propriety of coating, first oil, and opening, nistie medicines; while the hand and wrist should be continuously covered with flannel wet with the decoction of malt, or spirit of wine and water, and the fingers and hand kept in splints, which ought to extend barely to the end of the fingers, so as to prevent a return of the dislocation. The first point also remains quiet to a day.

When the ruptured ligaments have healed, linctures will need to be used the remaining stiffness and weakness of the joint.

REDUCTIONS OF THE WRIST, WITH CALLOSITY, STIFFNESS, AND TENDRIL.

A simple dislocation of the carpal bones from each other seems almost impossible. "The os metacarpale, however, has been known to be partially lacerated from the deep artery formed for it in the os scaphoideum, and os lunate." This displacement is produced by too great a flexion of the bones of the first phalanx on those of the second, and the os metacarpale serves a support on the back of the hand.—(Goussier's *Revue*, *Revue*.)

Chopart also met with a partial laceration of the os

metacarpale in a fracture. "Ramus Boyer has seen several examples of the accident, which, he says, is more common in women than men; a circumstance which is ascribed to the ligaments being looser in females, and to the bones of the carpus in them having naturally a greater degree of mobility. The fracture occurs when the hand is bent, and disappears when it is extended. The case does not produce any serious consequences, if the wrist be extended, and pressure be made on the head of the os metacarpale, the reduction is easily accomplished; though a removal of the displacement would be prevented, unless the extension and compression be kept up by means of a suitable apparatus during the whole time requisite for the healing of the lacerated ligaments. As the loose tendons of the accident are slight, few patients will submit to any tedious, tedious treatment; and sometimes the stygium is never corrected, all it is too late to think of replacing the bone. In general, therefore, he is obliged to be content with limiting the case as a sprain or contusion."

Mr. Astley Cooper has seen two cases of displacement of the os metacarpale in fracture: the accident produced a weakened state of the hand, and upon first relaxation of the ligaments. One example is also given of a dislocation of the os scaphoideum, which was thrown backwards upon the carpus, with the lower part of the broken radius.—(On *Dislocations*, p. 316, 322.) Compound dislocations of the wrist bones are uncommon, and generally arise from gunshot violence, or other great mechanical injury. In these cases, it is sometimes necessary to take away the displaced bone altogether; and too frequently the accident is such as to require amputation.

The connection of the metacarpal bones with the scaphoid, and with those of the carpus, is so close, and the degree of motion so slight, that a dislocation can hardly take place. Thus, Mr. Astley Cooper, in an exact dissection, has never seen them dislocated, except by the tearing of parts, or by the passage of heavy carriages over the hand; cases frequently demanding amputation.—(On *Dislocations*, p. 316.) The first metacarpal bone, which is articulated with the os trapezium, and admits of the protrusion of flexion, extension, abduction, and adduction, is capable of being lacerated; but the accident is uncommon, for reasons explained in my other work.

Although from the nature of the joint, between the first metacarpal bone and the trapezium, one might infer that a dislocation is possible in the four directions, backwards, forwards, upwards, and downwards, yet if we are to believe Boyer, the first case is the only one which has been observed. The accident is produced by the application of external force to the back of the metacarpal bone, which is suddenly and violently driven into a state of flexion, the bone usually coming from a fall on the outer edge of the hand. In this circumstance, the upper end of the bone is forcibly driven backwards, the carpal ligaments is lacerated, and the posterior part of the thumb are pushed up, and the head of the bone slips behind the trapezium.

For an account of the symptoms and treatment of this accident, I must refer to the fifth edition of my *First Lines of the Practice of Surgery*.

The first phalanges of the fingers may be dislocated backwards of the heads of the metacarpal bones. A fracture forwards would be very difficult, if not impossible, because the articular surfaces of the metacarpal bones extend a good way forwards, and the pain of the hand makes resistance to such an attempt. The first phalanx of the thumb is, however, often dislocated backwards behind the head of the first metacarpal bone, in which case it remains extended, while the second phalanx is bent.

These dislocations should be speedily reduced, for after eight or ten days they become irreducible. In a situation of the first bone of the thumb which was one old is usually reduced, and where the pain was shown behind the head of the metacarpal bone, the usual proposed riding down to the dislocation, and pushing the head of the bone into its place with a syringe. Even in cases where one side is bent, this kind of dislocation frequently cannot be reduced without the utmost difficulty; and the dislocation presents which have been most conspicuous in this particular accident, by Mr. Evans, the late Mr. Hey, Mr. C. Hall, and Boyer, demands the action of the surgical practitioner, and will not be cured by any other means.—(On *Dislocations*.)

1861, however, Sir Astley Cooper remarks, that he has seen few such, resulting from direct injury to the bones and ligaments, and he recommends their division, in order to facilitate their reduction, when extension will not succeed.—(*Ibid.* *Dislocation*, p. 322.) Dislocations of the wrist and little finger, thumb, and that of the thumb outward (which are possible cases), and dislocations of the first phalanx of the other fingers backwards, and of their second phalanges forwards, are all subject to being returned on the crown and of the affected thumb or finger, and at the same time pressing the head of the bone towards its natural situation.

After the reduction, the thumb or finger should be secured with tape and surrounded and supported with cotton-wool, the displaced ligaments being exactly cut being taken to keep the hand and forearm in a sling. The fixation of the first phalanx of any thumb behind the intersepal bone, requires peculiar treatment, as I have elsewhere explained.

DISLOCATIONS OF THE BONES OF THE PELVIS.

Experience proves, that the bones of the pelvis, notwithstanding the vast strength of their ligaments, may be dislocated by violence; thus three sacral spurs in a female forwards towards the lateral of the pelvis; the os pubis may be displaced forwards and upwards; and the bones of the pelvis may be totally separated at the symphysis, and an evident degree of mobility, or rather freedom than. For the production of these accidents the operation of enormous force is requisite; and in fact, three usual stories are told of a great height, the fall of a very heavy body against the os pubis, at a period when the body is fixed; and the pressure of one pelvis against a wall or post, and the wheel of a carriage or wagon. Hence, the dislocation is generally the least part of the mischief sustained by such kinds of violence, and the case is necessarily attended with commotion of the spinal marrow, injury of the sacral nerves, extension of blood in the cellular membrane of the pelvis as every of the permanent injury of the uterus, and fracture of one or more of the bones of the pelvis. As Sir A. Cooper has remarked, some of these cases complicated with fracture, are liable to be mistaken for dislocations of the thigh:—"When," says this gentleman, "a fracture of the os pubis occurs, it happens through the acetabulum, the head of the femur is drawn upwards, and the trochanter major moves forwards so that the leg is shortened, and the knee and foot are turned upwards. Each a case, therefore, may be readily mistaken, if the os pubis is separated from the os sacrum, and the os pubis and ischium are broken, the head is slightly turned from the other; but the knee and foot are not turned upwards. These accidents may generally be detected by a rupture perceived in the socket of the thigh, when the os pubis appears bare to the view of the thigh, and there is greater motion than in a dislocation of the thigh."—(*Surgical Remarks*, part I, p. 48.)

In addition to the complications which may attend a dislocation of the bones of the pelvis, and more immediately from the internal violence, the case is always attended by inflammation, which may be very serious, and only in a small amount of the extent of the anterior various affections, the disease such inflammation may extend to the peritoneum and viscera of the abdomen and pelvis, and lastly itself when it has or three weeks.

Little notice a case in which the os ischium of the right side was found separated from the os sacrum as to prevent, nearly three inches behind it. This accident was caused by a heavy sack of wheat falling on a soldier.—(*Ibid.* *Dislocation*, p. 44, 45.)

In a case recorded by Sir A. Cooper, the posterior part of the sacrum was broken off, and the head of the thigh bone had slipped from its socket; the fragments extended across the os pubis towards the os ischium, the bones of which were separated at the symphysis nearly an inch asunder. The os were separated on each side, and the left os pubis, ischium, and os sacrum broken.—(*Surgical Remarks*, part I, p. 48.) In the same work may also be noticed another case of fracture of the body of the os pubis and union of the ischium, sustained with a fracture of the right os ischium from the os sacrum, and fracture of the ischium of the os pubis.

When these cases are not proved fatal from the direct effect of the great violence communicated on every part,

or from peritonitis, the same unpleasant even sometimes follows rather later from separation of the articular surfaces taking place, and abscesses forming in the cellular membrane of the pelvis.—(*Ibid.* *Dislocation*, p. 44, p. 117.)

A case in which a dislocation of the left os ischium upwards had a successful termination, was attended by Lewis, Hunt, and Chamberlain, and is published in a modern work.—(*Ann. de l'Hôtel des Malades de Paris*). As the reduction could not be effected, and at first, antiphlogistic treatment was followed for some days, when more attempts to replace the bone were made, but could not be continued, as they caused a recurrence of such and other bad symptoms. A third trial, made at a later period, was not more efficacious; and all thoughts of reduction were then abandoned. After the patient had been kept quiet some time, though not as long as was wanted, he gained his bed and began to walk about on crutches. I do not understand, however, as it is asserted, how the weight of the body could now bring about the reduction, which had been previously attempted in vain. In this last way, the result was the patient's recovery. The fact clearly proves, as Boyer observes, that in cases of this description the most important object is not to aim at the reduction, but rather to oppose, by every means in our power, inflammation and its consequences. Properly the use of the caustic is necessary, and expression as immediate of urine, or the salutary discharge of the feces, demands the strictest attention to cleanliness. In these cases, if the patient live any time, there is also another source of danger, consisting in a tendency according to the soft parts, on which the patient lies, and which, when they have been bruised, require still greater vigilance.

The os coccygis is not so easily dislocated as first stated. Boyer has seen it displaced in a man who was greatly distressed by disease. This subject had considerable distress about the coccyx, and the bone itself was torn. There was an interspace of nearly two inches between the os sacrum and base of the coccyx. In proportion as the tumor increased in size, the bone reappeared in this position, and at length united to the os sacrum, notwithstanding the action of the levers and oil, which are inserted into it. This case, however, was not an accidental fracture, and it clearly arose from the destruction of the ligaments by disease.

Authors mention two kinds of dislocation, to which the os coccygis is liable; one upwards, the other downwards. The first is always connected by external violence; the second by the pressure of the pelvis itself in difficult labors. First, difficulty of making the knee and thigh move, and sometimes even, sometimes violent in disease which attend the pelvis, are symptoms said to attend and follow dislocations of the coccyx.

The best authors have regard also to the reduction, as well as the bone with spontaneously return into its place as soon as the cause of displacement ceases; and the introduction of the finger within the rectum, and handling of the perineal and internal parts, are more likely to increase and obstruct inflammation, and produce abscesses, than have any beneficial effect. In short, the usual plan is to be content with exposing quickly, and adopting antiphlogistic measures.

DISLOCATION OF THE KNEE.

J. K. Parr was silent on this subject, as he thought such cases never occurred. Since his death, a French surgeon, Bistart, has treated an instance which is supposed to be a dislocation of the posterior extremity of the tibia from the femur. Sir Boyer clearly proves, that there were no true reasons for this opinion, and that the case was only a fracture of the neck or head of the bone near the spine.—(*Traité de Mal. Chir.* p. 4, p. 224.)

Andrew Parr, Easton, Jüncher, Pott, and Hunter not only affirm the occurrence of luxations of the knee, but describe different species of them. Lankford also extended the term *luxation* to cases in which the head of the tibia separated by disease, the process of anastomosis, &c.

In a recent work, may be read the particulars of a case where all the ribs are said to have been dislocated from their articulations. The accident arose from the chest being violently compressed between the beam of

a stiff and the weak. In such a case there is no reason of reduction except the effort produced by forcible compression; nor are there any modes of relief but bleeding, and the application of a plaster round the chest. — (See C. Holt's Surg. (3d. p. 171.)

DISLOCATIONS OF THE THIGH-BONE.

The head of the thigh-bone may be dislocated upwards in any direction of the acetabulum; upwards and forwards on the body of the acetabulum; downwards and forwards on the femoral oval; and backwards on the ischial notch.

The dislocations upwards and that downwards and forwards, are the most frequent.

The dislocation of the thigh-bone upwards on the lesser of the lesser is attended with the following symptoms. The limb is from one inch and a half to two inches and a half elevated from its fellow, the thigh a little bent and carried forwards. The knee inclines more backwards and upwards than the opposite one; the leg and thigh are turned forwards, and the foot points in the direction; the toe resting, as Sir A. Cooper remarks, against the tarsus of the other foot. — (Surgical Essays, part 4. p. 25.) There is an approximation of the trochanter major to the anterior superior iliac spine, and the thigh, and at the same time it is elevated and carried a little forwards. It is also less prominent than that on the opposite side, and the painful resistance of the hip is less dependent. The natural length of the limb cannot be restored without reducing the fracture; the foot cannot be turned upwards, nor any attempt to do so causes pain; but the inclination of the foot upwards may be increased. — (Ibid.)

When attempts are made to draw the thigh away from the other, it cannot be accomplished. But the thigh may be slightly bent across its fellow.

A dislocation of the lesser of the lesser is generally at once readily discriminated, from a fracture of the neck of the thigh-bone, within the capsular ligament, by the position of the limb upwards, a position which is unusual in a fracture of any part of the os femoris.

In a fracture of the neck of the thigh-bone (says Sir A. Cooper) the knee and foot are generally turned upwards; the trochanter is drawn backwards; the limb can be readily bent towards the adductor, although without pain; but, always, the limb which is shortened from one to two inches by the contraction of the muscles, can be made of the length of the other by a slight extension; and when the hip-joint is observed the leg is again shortened. It when extended, the limb is raised, a crease can often be felt, which arises when rotation is performed, under a shortening of the limb. The fractured neck of the thigh-bone, within the capsular ligament, rarely occurs but is advanced age, and it is the effect of the most trifling accident; owing to the absorption which takes place of the bone trabeculae at advanced periods of life. Fractures external to the capsular ligament occur at any age, but generally in the middle periods of life; and these are easily distinguished by the creases which attend them, if the limb is rotated and the trochanter is commensurate with the head. The position is the same as in fractures within the ligament. The proportion of fracture of the neck of the thigh-bone which I have met, is at least four cases to one of dislocation. — (A. Cooper, Surg. Essays, part 4. p. 28.)

The position of the limb upwards, in most of fractures of the neck of the thigh-bone, is temporary, though sometimes not so. Sir A. Cooper gives one example of it, under the name of Mr. Langstaff — (On Fractures, Preface). To reduce this dislocation, the patient should be placed on his opposite side upon a table firmly fixed, on a large four-posted bedstead. A cloth being judiciously to be so placed under the hip-joint, and the limb being carried below the patient, the other limb then they put so be fastened to one of the four posts of the bed. Then the patient will be fixed, so as to allow the necessary extension of the thigh-bone to be made. About nine inches may be taken during the extension to keep the screws and needles, or the needles in women, from being torn by the muscle passed under the peritæum. The patient may be then fixed by the assistant.

The best position of the patient may be placed against the extending force to be applied to the inferior part of the leg, in order that it may be as far as possible from the parts which resist the return of the head of

the bone into its natural situation. In this country surgeons generally make the extension by means of a sheet, or the strap of a pulley, attached round the limb, just above the ensilage of the os femoris. The direction in which Sir A. Cooper makes the extension is at the knee made by the table, when it is brought across the other thigh a little above the knee. As soon as the head of the bone has been brought on a level with the acetabulum by the assistants who are holding the extension, the surgeon is to take it up this way by pressing on the great trochanter, it is raising the knee and foot gently outwards, as practised by Sir A. Cooper.

The extension should always be made in a gradual and increasing manner; at first gently, but afterwards more strongly; never violently. The efficacy of reduction arises from the great power and resistance of the muscles, especially the psoas and iliacus, which will at length be relaxed, so as to yield to the extending force, if once it is taken that it is recognized the necessary time, without the least intermission. Sometimes, when there is difficulty in bringing the head of the bone over the lip of the acetabulum, Sir A. Cooper raises it by placing his arm under it and the joint.

The Government of all the symptoms, and the same made by the head of the bone when it is up into the acetabulum, ensure that the reduction is effected. Therefore, however, is not always made when patients are used. The table is afterwards to be kept from slipping out again, by tying the patient's knees together with a bandage placed a little above the knee. The patient should be kept in bed at least three weeks. The joint, and with the joint with a compress over it. The treatment to be given by the reduced ligaments is usual, and the exposed joint is covered. The patient may be fixed on a four-posted bedstead by Sir A. Cooper.

Mr. Key gives the following description of the way in which he reduced a case of this kind.

"The extension of the limb must be made in a right line with the trunk of the body; and, during the extension, the head of the bone must be directed upwards as well as downwards. A temporary traction of the os femoris as the arm is, towards the knee (the patient lying prone), seems likely to facilitate the great trochanter, being it returns to its natural position, and draw the head of the bone towards the acetabulum. These circumstances led to the following method: a folded blanket was wrapped round one of the bed-posts, so that the patient, lying in a prone position, and astride of the bed-post, might have the affected limb on the outside of the bed. The bed was raised immediately by placing it against a small iron pillar, which had been fixed for the purpose of supporting the curtains. The leg was bent to a right angle with the thigh, and was supported in that position by Mr. Lamb, who, when the extension should be brought to a proper degree, was to give the thigh its ordinary motion, by pushing the leg forwards; that is, towards the other femoral extremity. Mr. Lamb sat before the patient's knee, and was to assist in giving the necessary motion, by pushing the knee outwards in the same direction. I sat by the side of the patient, to raise the head of the bone downwards, and upwards during the extension. Two long towels were wrapped round the thigh, and above the crutches; one lower passing on the front of the knee the other on the situation. These towels made the extension, but when we attempted to give the thigh its ordinary motion, we found it resisted by the towels, which passed on the inside of the knee and leg. We therefore passed both the towels on the outside; and in this position, the extension was continued as given the ordinary motion. The first effect was relaxation of the bowels; were this passed, and the desired effect, and the head of the bone moved downwards and upwards into the acetabulum. — (Phys. Journal Observations, p. 202.)

For the purpose of dissolving the osseous, and the osseous callus to produce a permanent fixation by a osseous connection, immediately after the reduction is made, a practice which, when the general state of health does not forbid it, is advisable, as it offers very materially the resistance of the muscles. Sir A. Cooper gives a full practical application, as well as the waste bath, and subsequent doses of tartaric acid. Afterward, every four hours to twenty drops of blood; this gentleman gives the patient a

both heated to 130 degrees, and gradually raised to 11 degrees, until fermentation started. When in the bath, the fermenter is also to take a grain of tartaric acid every ten minutes, until several ounces will fit in as it is removed from the bath, put in three lots, and raised between 190 and 200 degrees, or say, on which a sample is made; it is ready to be placed on its side, into which two rings may be inserted. The mixture is ready for B. Coker, performed the commonest work, and by making the various sorts of flour, sugar, etc., having been denied in the name of the *First House of Society*. I had one last experience. Of Mr. Hays's part, especially the director of the bank of it, is important as a scientific opinion on little published, is known where the reduction has been at 200 and 170. (The *First House*, p. 10.) In the middle, it is fully in order. Each part of distillation, the above mentioned in distillation process, the increasing of heat of which is the same, and the water in the top, or the top of the vessel, is put to the water in the bottom.

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Mr. HAY said, that "in this system of education (distributing and circulating, on the basis of the laws of Yon. 1-8

extended lower than the acromion, that is, on a level that is a right line with the neck. A right line must extend the head of the bone further from its proper place, and directly present, instead of ascending, elevation. The extension ought to be made with the right at a right angle, to include something less than a right angle in the trunk of the body. When the extension has removed the head of the bone from the natural oblique direction, which covers the great femoral artery, the supinator, the upper part of the os humeri must then be put in a direct position; which end will be greatly assisted by moving the lower part of the os humeri, in the same manner, in a contrary direction; and, by a rotatory motion at the same time, its crest will, turning the head of the bone towards the acromion." (Ibid., p. 216)

The wooden fence illustrates Mr. Hay's policy. The fence post, on the right side of the fence, which the nation left, was placed in contact with a small immovable iron plate (about an inch square) in Dickinson, which is the only stone used for supporting the fence-post of the fence. A barbed wire is wrapped round the fence post and plate, the present was placed outside of them, with the left hand close to the post, and his right hand on the outside of the fence. It takes some of the fence wire and beyond the market and the fence, that the fence post be kept during the election.

The patient sat upright with his shoulders in contact with the golden handles which curved the bedpost. He appeared relaxed by putting his arms about the post, and as I passed he turned him to look at me from reading backwards. He was also squirmed in each side.

Two half-owls were put around the lower part of the thigh, after the part had been well defended from excretion by the application of a tannic rubric. The hind wife in the lower form was made upon the anterior part of the thigh, and the cranium extended to be green to the eye might not be attacked by the disease.

The things being played is a horizontal position, or rather a little advanced, with the leg hanging down at right angles to the thigh. I put down upon a chair the two opposite patients, and directed a gentle traction to be made by the assistants standing on my left side. This was done with the view of drawing the head of the bone a little nearer to the middle of the thigh, and the extension had this effect. I then joined the two assistants who held the middle of my right side, by which means the extension would be made in a direction a little inclined to the vertical line. Mr. Loper stood on the right side of the patient, with his hands placed on the upper and lower side of the thigh, for the purpose of drawing the head of the bone nearer the acetabulum, when the extension should have been continued, until the bone came into its place.

I desired the assistants to make the extension slowly and gradually, and to give a "rest" when it arrived at its greatest degree. At that moment Mr. Logan drew the upper part of the body upwards, while I pushed the lower upwards, and used just the 60 pounds a considerable muscular tension, by pushing the right leg upwards the left. By these combined motions, the head of the 60 pounds was thrown upwards, and upwards, up, in other words, directly towards the horizontal, and which it covered as our first attempt made in this manner. (MS. A, 218.)

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In the context of The purposes of the book, however, it seems fairly clear, and the opposite to what Boyer has said, on A's second remarks, that there is a sign, namely, a vowel and syllable. — (Surgical Knowledge, 1.1.1.35.)

The head of the bone felt in the grain, and the face

In such cases, if there be no previous morbid relaxation of the parts, a portion of the capsular ligament will be torn. (A. Cooper, on Dislocations, &c. p. 176.) The generality of cases are easily relieved by pressure when the extension of the leg have been completely relaxed; but owing to a lax state of the ligament of the patella or other predisposing causes, the bone is sometimes actually kept in its proper situation, unless a roller is applied. The dislocatory action of the joint is to be opposed by steadily pulling, and the use of the loco flexor instruments. The joint must be kept quiet a few days, and then gently moved in order to prevent stiffness. When the anatomical situation is such that a relapse is likely to occur, they should be kept in a fixed position, with a strap and bandage above and below the patella, should be worn as recommended by Sir Astley Cooper—(On Dislocation, p. 76.) The location of the patella upwards, gives a figure of an ligament, is a case followed by a considerable degree of inflammation. Hence Sir Astley Cooper particularly recommends early depletion; the use of evaporating lotions from four to seven days, and then a roller to the foot and leg. The leg is to be kept extended by means of a spiral behind the knee; a double strap is to be buckled round the lower part of the thigh, and so on, on each side, another is buckled, which extends from the side of the foot, and is carried up each side of the leg. Thus the patella is kept down, and an apparatus is applied for the ligament to unite. In a month, the knee will be gradually moved every day.—(On Dislocations, p. 302.)

DISLOCATION OF THE KNEE.

The tibia may be thrust forwards, backwards, or to either side. As Boyer observes, complete dislocations of the upper end of the femur are extremely rare, because the anterior surface of the condyle of the femur is so extensive that the tibia cannot be thrust forward from it without a prodigious laceration of the ligaments, tendons, and all the rest of the soft parts.

The condyles of the femur are disposed in such a manner, that, in the extreme flexion of the leg, the anterior surface of the upper end of the tibia are still in contact with these bony surfaces; and this circumstance, together with the resistance made by the ligament of the patella, the patella itself, and the tendons of the extensor muscles of the leg, renders a sudden dislocation of the tibia backwards so difficult, that Boyer seems even to question the possibility of the accident, notwithstanding the case related by Hunter.—(Treatise on the Fracture, &c. p. 205.) This dislocation, however, sometimes really happens, not large amounts of ligaments: the case is related by Sir A. Cooper as producing the following appearances; a charred state of the limb; a protrusion of the condyle of the femur; a dislocation in the situation of the ligament of the patella; and a swelling of the leg upwards; which last situation differs from that of Boyer, who declares that the leg is bent to a very great degree, and cannot be extended again.—(Med. Chir. &c. p. 201.) It appears further, from the particulars of the example of this dislocation, given by Dr. Williams, that the dislocation appears to complete the bend of the tibia during flexion instead of the condyle of the femur into the knee. The tendons connected of the patella to the femur muscle was ruptured, and, probably, not only separated of one tendon, all of the ligaments of the patella, and a considerable amount of the muscles have lacerated.—(Surg. and Anst., vol. 2, p. 78.)

But if a sudden dislocation of the tibia from the femur backwards is impossible, the same remark cannot be made respecting a dislocation, in that direction, gradually produced by the effects of disease. Several cases of the latter kind have fallen under my own observation.

A dislocation of the head of the tibia forwards, from the condyle of the femur, cannot happen without the greatest difficulty, or the accident would be likely to be attended with laceration of the lateral ligament, and other, or posterior ligaments, all which need to convert the leg from being too far extended; and, in addition to all this injury, Boyer calculates that the head of the gastrocnemius, the popliteus, and the posterior tendons of the leg, would be immediately ruptured, and even torn. However, it does not seem that it is one complete fixation of the knee, when the anterior part of the tibia has been thrust into the space of the head

of the tibia, the external condyle being dislocated backwards and upwards, and the internal one thrown forwards upon the head of the tibia, the dislocation proved that "scarcely the osseous surface, the popliteal artery and vein, the lateral, nor the crucial ligaments were ruptured."—(A. Cooper, on Dislocations, p. 197.) Both bones of the gastrocnemius were lacerated, and the back portion of the capsule, ligament, extremely torn. In 1802, an instance of a laceration of the tibia upwards was seen at Gay's Hospital. According to Sir Astley Cooper, while the tibia projects forwards the dislocation is supposed, and driven somewhat laterally as well as backwards. The os femoris makes great pressure on the popliteal artery, as to prevent the pulsation of the anterior tibial artery on the tibia; and the patella and tibia are drawn forwards by the rectus quadratus.—(Surgical Essays, part 2, p. 72.)

Dislocations forwards or upwards, though more frequent than the foregoing ones, are still to be considered as rare, and are always incomplete. In the dislocation forwards, the condyle of the os femoris is thrust upon the external malleolus, cartilage, and the tibia projects in the lateral side of the foot, so as to cause to dislocate the nature of the accident; and a depression may be felt under the external condyle. In the dislocation of the head of the tibia upwards, the condyle of the os femoris is thrust upon the tibia, sometimes cartilage, or, under Sir Astley Cooper says, rather behind it.

In both these cases, this position, though that the tibia is rather thrust upon the os femoris, so that the condyle of the latter bone is thrust somewhat back, worse as well as upwards or inwards.

I have stated that lateral locations of the tibia from the femur are always incomplete; but the possibility of a complete dislocation upwards seems to be established by the third case, of LACROIX.

Whenever the tibia is dislocated from the femur, the accident has generally happened either while some force was exerted upon that bone, at a period when the tibia was fixed just immovably, or else while the tibia was, as projected, or thrust with great violence, while the leg itself was freely fixed.

These accidents are all necessarily relieved by making proper extension, and placing the head of the tibia in the proper position. The great object, after the reduction, is to avert inflammation of the knee, and possibly the rupture of the ligaments. The first remedies the rigidity, immobility of the articulation, pain—bleeding, leeches, low diet, opening medicines, and a cooling evaporating lotion; both require the limb to remain perfectly immovable. With respect to splints, I observe that their position would be objectionable. As soon as the ligaments have grown together, and the danger of inflammation is over, which will be in about three weeks, the limb should be gently bent and extended every day, in order to prevent stiffness. Treatments will now also be of service.

In the next, we must consider the cases which were first described by the late Mr. Hey, and are named by Sir A. Cooper partial luxations of the thigh bone from the acetabulum cartilages. Mr. Hey observes, that the dislocation may happen either with or without resistance. When no resistance has occurred, or the effects of it are removed, the joint, with respect to shape, appears unaltered. If there is any difference from its usual appearance, it is that the ligament of the patella seems rather more relaxed than that of the sound limb. The leg is usually loose, or extendible by the hands of the surgeon, and without pain in the patient; or, at most, the degree of tenderness caused by the fluxion and extension is trifling. But the patient himself cannot freely bend, nor perfectly extend the limb in walking; and he is a great deal to walk with an irritable and small degree of lameness. Yet though the leg is stiff in walking, it may be freely moved while the patient is sitting down.

Mr. Hey notices this complaint to be a disease which had the effect of breaking the condyle of the os femoris from having truly is the hollow formed by the acetabulum, cartilages, and articular depression of the tibia; or, at least, a laceration of the lateral or crucial ligaments; or some slight detachment of the osseous cartilages.—(Phil. Chir. p. 322, et. 2.) Sir A. Cooper says, the most frequent cause of the accident is the point of the foot, while pressed, striking against any projection, which joint is immediately felt in the knee, and the patient becomes incapable of perfectly extend-

where there is dislocation of the distal extremity at the proximal end, writers have done, in this it should be named a *dislocation of the distal extremity*, or, at least, the direction in which the dislocation is carried.—(Gosselin, *Med. Chir.* p. 3, 1855.)

With respect to the treatment of the preceding case, Dupuytren admits, that Pott's method, easily effects a reduction, though complete or permanent; it, but, as I have ascertained in practice in the last edition of the *First Lesson of Surgery*, the practice recently proposed at the Hôtel-Dieu, it would be useless repetition to enter into the subject again. Mr. A. Cooper appears to prefer the rule of treatment as Mr. Pott's principle; but gives no very essential point of advice, which is, that the splint upon which the upper part of the limb must rest have a fulcrum, "to give support to the foot, prevent its eversion, and preserve it at right angles with the leg." It must be understood, however, in case it is to be applied to the parts, and the connection, and require relief by taking band from the arm?—(Surgical Essays, part 2, p. 116.)

When the tibia is dislocated *outwards*, the internal lateral ligaments are usually ruptured, or pulled away from the bone, and the outer malleolus broken away from its fracture of the tibia. As a part of this, sometimes, however, Dupuytren and Mr. A. Cooper differ, as the latter asserts that the dislocated tibia is broken. In many cases, he says, the fracture is not confined to the malleolus, the tibia is broken through the anterior border of the tibia, which is directed forwards and outwards upon the malleolus, in front of the malleolus. Sometimes the malleolus is fractured, and the lower extremity of the tibia broken into several splinters. He maintains, that when the tibia is in this position, the external lateral ligaments are ruptured. The foot is thrown outwards, the outer edge resting upon the ground, while a considerable protrusion is made by the malleolus coming under the skin. The position is generally caused by the patient, or a wheel of a carriage over the leg, or a violent blow at the foot forwards in jumping or falling.—(J. Cooper, ed. 4th, p. 112.)

The reduction is accomplished by relaxing the tension of the calf, making extension to the axis of the leg, and passing the lower end of the tibia forwards towards the malleolus. "The tibia is to be laid upon its inner side, resting upon a splint with a foot piece, and a pulley to be placed opposite the tibia just above the outer angle, and extending a few inches upwards, so as to secure extension to raise that portion of the leg, and prevent the tibia and tibia slipping over the malleolus, as well as to lessen the pressure of the soft parts on the malleolus upon the malleolus."—(Surg. Essays, part 2, p. 112.) Mr. A. Cooper also advises giving the external rotation to the foot, the foot being placed outwards as possible downwards.

Dupuytren's manner of treating this case is described in the last edition of the *First Lesson of Surgery*.

A complete dislocation of the lower end of the tibia forwards seldom happens without the tibia being first broken, and either the base of the malleolus internal fractured, or its part torn away. The foot being thus laid upon by the external and lower malleolus, and sustained by the malleolus and ligaments, while the powerful contracture of the muscles of the calf, the malleolus passing behind the tibia, while this projects forwards under the tibia and distal of the tibia.—(Dupuytren, *Art. de Chir.* p. 287, 4th Paris, 1813.) The foot of course is much shortened, the heel protruding, and firmly fixed, and the toes point downwards. Upon dissection, the tibia is found to rest upon the upper portion of the os pubis, and on the condyle of the femur. The anterior part of the os pubis is injured is less through; the distal ligament is only partially lacerated; and the three ligaments of the tibia remain attached.—(J. Cooper, ed. 4th, p. 110.)

This case is really more difficult of reduction than the tibia in which the foot is thrown outwards, and the cause is owing to the powerful contracture in which the muscles retain the extension of the parts, and placing them in their natural position again. As Dupuytren observes, it is true that such resistance may be lessened by relaxing the muscles, and drawing the patient's attention from his limbs; place, which fully answers for the relaxation of the other above-mentioned muscles, yet, in that case, the resistance, they are so

stiffened, and here a greater effort is required in being the foot thrown forwards, and to place the malleolus under the tibia. And a still greater difficulty is to keep the parts reduced during the time necessary for the tibia and malleolus to be firmly united. As far, the upper surface of the malleolus, which is convex from behind forwards, is so great, that it is hard to make the tibia rest securely on the anterior surface of that bone, which at last necessarily lies upon by the extreme process of the leg, as it is to have a tendency to slip behind the lower end of the tibia. In addition, therefore, in the last position, Dupuytren shows a necessary belt to require an apparatus, which supports the foot forwards, and the upper end of the tibia backwards.—(Gosselin, *Med. Chir.* p. 185.) As this apparatus has been described in the last edition of the *First Lesson of Surgery*, I need not explain it again.

Mr. A. Cooper prefers keeping the foot upon the foot, resting upon a pulley. A splint, with a suitable pad and a foot-piece, is to be applied to each side of the leg, care being taken to keep the foot well supported at a right angle with the leg.—(Surgical Essays, part 2, p. 116.)

Besides the complete dislocation of the tibia forwards, a partial one is sometimes met with, where one half of the articular surface of the bone has separated or separated, and the other to the malleolus. According to Mr. A. Cooper, the tibia is broken; the foot appears to be dislocated; and there is some considerable protrusion of the foot. The foot points downwards, it cannot be put flat on the ground, and is weakly stiff, and the foot continues drawn up. The reduction, if not detected and reduced in its early stage, attended with a great deal of pain, the change in the position of the muscles, and the position in which the tibia has moved, no ordinary any resistance, even though great force be employed.

Dislocation of the tibia, forwards backwards, and not upwards, during infancy, Dupuytren has observed, but with this is three cases; though he has seen some instances of lateral dislocation. It must be obvious to every body, says he, that when the tibia is violently bent, or extended, many powerful tendons resist the dislocation, in question, and prevent the success with which the reduction is effected.—(Gosselin, *Med. Chir.* p. 185, 4th Paris, p. 28.) A fracture of the tibia from the malleolus backwards, Mr. A. Cooper has never had an opportunity of observing; a proof of the rarity of the accident.

A dislocation of the malleolus, either simple or complicated with a dislocation of the tibia, as Mr. Hey has remarked, is an accident which does not often occur. Above, the malleolus is articulated with the tibia and fibula; below, it is united by means of a capsule ligament, to the os calcis; while in front, it is connected to the os calcis by a superior and broad internal lateral ligament. Thus situated, it is evident that its dislocation is not likely to happen with great frequency; and yet this observation must be received only as a conjecture; for the cases of dislocation of the malleolus, are never noted, or rather ascertained.

When a dislocation of the lower end of the tibia is combined with one of the malleolus from the os calcis and os navicularis, and the ligaments which keep these bones together are usually destroyed, while a considerable portion of the os calcis itself protrudes through the wound in the malleolus, it is no judged prudent to attempt the preservation of the tibia, it is better perhaps to incise the tibia, Pott, Trye, and Keene, and extract the malleolus altogether.

A fracture of the malleolus, attended with a wound in the skin, is a serious and embarrassing accident; for, in general, the reduction is so difficult, that it is not every year where the case was desired a good deal of assistance.—(Gosselin, *Med. Chir.* p. 185, 4th Paris, p. 28.) While the dislocation is in question, the malleolus is gradually thrown forwards upon the os calcis, forming a hump on the inner and bulging a little over to the outer or outer side of the foot. In many cases of this dislocation, the reduction is found to be impossible. Here, as Pott observes, the reduction does not depend upon the head of the bone being contracted in the narrow opening of the capsule; but rather upon the impossibility of making it a solid body, from the pressure of the ligaments.

infected cases in the writings of Lushington, Gault & Chalmers, Tronchese, and other authors of the nineteenth and twentieth centuries. Among Lushington has given the appearance of layers with circles in a fungus in most of the dura mater. The swelling occurred in a short night, years old, was not accompanied, two days after an opening had been made in it.—(Gault, *S. vol. 5, 5*.) Another curious case which happened in a child, and the notes of Chalmers & Gault, is cited as a singular body formation.—(Lushington, *Tronchese*, *vol. 2*, *vol. 6*, 1857, *vol. 28*.) Lastly, Chalmers, a physician of Montpellier, has recorded the history of a lady who died from the consequences of a fungous tumor of the dura mater. The disease was so much pressing, as to interrupt the period of pregnancy. The swelling was covered with crusts. Post-mortem, a fungus was seen, resembling the fungus to be described, but its effect was overruled. After death a fungus of the dura mater, with a perforation in the skull, was observed, but it is described by the author as a hard, very substance, accompanied with pus and infection.—(Chalmers, *vol. 13*, p. 45. See Lushington, *Tronchese*, *vol. 1*, p. 45, *vol. 1850*.)

Several surgeons, greatest of the real character of fungous tumors of the dura mater, used often to take, not the main tumor, and false swellings as the brain, but the disease was of a chronic nature, and made their appearance gradually, in the form of a tumor, which makes its way through the bones of the cranium, often by, and immediately blends itself with the integuments, which show, as if were, to make a part of it. Fungous tumors of the dura mater may sometimes spontaneously in any part of the membrane, but they are particularly apt to grow on the walls, which extend to the upper part of the skull, or to the sides. They are firm, reddish, and chronic, sometimes as if they were the substance of the brain, sometimes, affecting the vessels, which supply the dura mater, and frequently with those of the brain. It is very difficult, one might say impossible, to determine whether, in an instance of this kind, the fungus belongs to the dura mater or the substance of the brain tissue. The general belief, however, is that the tumor is situated on the skull, and that the disease originates in the dura mater. The patient, who is the subject of the first case, stated as a matter by M. Louis, had noticed on the side of the head, and could only trace the origin to a small which he had had with him for five months previously, and in which the head itself had not received any violence; but from this time he experienced a burning sensation, which continued till he died. The covering and dura mater were found both equally diseased. Though this case may tend to prove that fungus tumors of the dura mater only form spontaneously, yet it is not less confirmed by the explanation of a vast number of cases, that this affection more frequently follows blows on the head, than any other cause. Hence a slow kind of inflammation of the dura mater is produced, which ends in a constant effusion, the duration of which always precedes the destruction of the bone. In the memoir published by M. Louis in the fifth volume, first of those of the *Revue Médicale de Vaugy*, there is a very interesting case, illustrating the facts of the present disease.

The subject was a young man, aged twenty-one, who had a considerable tumor on the left side of the head, which was taken for a dermoid tumor.—(See the article.) The swelling had begun in the region of the temple, and had gradually acquired the magnitude of a walnut head. The external car was displaced by it, and pushed down as low as the angle of the lower jaw. At the inner part of the circumference of the base of the tumor the compliances of the perfected tumor and the pulsations of the brain could be distinctly felt. Some parts of the tumor were white and hard, others were soft and fluctuating. A plaster which had been applied brought on a suppuration at some points, from which an infected matter was discharged. Swellings and throbs again and again, and the case died in a few days from the effects of the disease. The disease was a carcinoma of the dura mater, which had been excited, perhaps, by a contusion of the whole portion of the skull corresponding to the extent of the disease.

When a fracture of the bone has already occurred, it makes its way externally through the parts soft or hard which are opposed to it. The swelling, in low-

ering circumstances, is partly bleeded with the dura mater, and its pressure produces an absorption of such parts of the skull as occur in its enlargement. It consequently attacks the skull externally, continuing itself with the scalp, and presents itself externally in the form of a preternatural, soft, swelling swelling, which may sometimes be very apparent, or a third absorption or a pulsation which may make it be mistaken for an aneurismal tumor. When over the swelling has made its way from the cavity of the cranium, it expands on every side under the integuments, which readily make way for its growth. The scalp becomes distended, smooth, and indurated over the extent of the tumor, and slowly it elevates. The tumor disengages from the integuments in thin and soft layers; the outer part of the tumor is embedded with the integuments, and when the skull is which it rests, so that in this state it is not to mistake the tumor for one which has a solid base. While the swelling thus increases it was externally, it may enlarge internally. The latter change takes place in parts, while the opening in the cranium is not large enough to admit the whole mass of the tumor, which then depresses the brain, and before it is contained within it forms a shell. But this slowly quickly disengages, and becomes soft and moist to the touch, as soon as the tumor projects externally. The tables of the skull are absorbed to the swelling arises externally, but it is remarked, that the tumor or fungus always spreads much more extensively destroyed than the external one. Sometimes new bony matter is found deposited around the opening in the cranium.

It is asserted, that whatever may be the situation of a fungus tumor of the dura mater, the outer axis of the membrane, upon which the disease begins, is alone exposed, the inner layer and the pia mater being always protected.—(Lushington, *Tronchese*, *vol. 1*, p. 30, *vol. 1850*.)

In one of these cases, detailed by Walther, the outer layer of the dura mater was quite normal, though the half of the tumor, which was very large, was within the skull, where it had formed for itself a deep excavation in the posterior side of the brain. And, what is remarkable, notwithstanding this large change, the patient, the Mary below her death, retained all her intellectual faculties, and the power of voluntary motion.—(Lushington, *Tronchese*, *vol. 1*, p. 30, *vol. 1850*.)

According to various writers, fungus tumors of the dura mater have been related by continuous as the skull falls on the vertebra, crumpling of the head or whole body; that vertebra, vertebra, vertebra, vertebra, &c. The three last of the alleged causes, however, seems to be little better than mere conjecture; and the same may be said of Walther's idea, that the disease is of a similar nature to white swelling of the lungs.—(Lushington, *Tronchese*, *vol. 1*, p. 30, *vol. 1850*.)

Even children of the most tender years are liable to the disease. M. Louis has related, that a child two years of age, had a fungus of the dura mater, which had produced a swelling above the right ear, attended with a fluctuation of a portion of the parietal and temporal bones.—(M. Louis, *Revue Médicale de Vaugy*, *vol. 5*, *vol. 21*.)

Though the common opinion is, that these fungi grow slowly, than the dura mater, however, some cases that the vessels of the dura have a considerable share in their production.—(Lushington, *Tronchese*, *vol. 1*, p. 30, *vol. 1850*.)

A similar belief was entertained by Boerhaave and Kestner, and is repeated by Walther and Walther, the latter attributing the disease to a direct action of the vessels of the dura mater and pericranium, attended with an absorption of the bony part of the bone.—(Lushington, *Tronchese*, *vol. 1*, p. 30, *vol. 1850*.)

The existence of a fungus tumor of the dura mater cannot be ascertained, so long as there is no external change. The effects produced may arise from many causes, that there would be great risk of a false mistake in relation to any particular case. This is not the case when there is an opening in the skull. Then a fungus tumor of the dura mater is the cause of the disease, because that it comes from within. When the swelling is externally limited, such a resolution is perceived, as when the tumor

tending dry pockmarked effluvia over the skin. On feeling with extreme pain is commenced, and sometimes a numbness in all the limbs, stupor, and other more or less alarming symptoms. The tumour is some measure rounder, less hard, especially when suit very large, and gradually runs up and downwards again. When the pressure is discontinued. Sometimes there is pain; at other times there is none, which may be owing to the manner in which the tumour is affected by the edges of the bone through which it passes. The pain is often made to go off by compression, but returns as soon as this is taken off. The tumour has an alternate motion, derived from the pulsation of the brain, or of the large arteries at its base. This throbbing motion has led many practitioners to mistake this disease for an aneurism, as happened in the second case related in the memoir of M. Louis. When the tumour is pushed sideways, and the finger carried between it and the edge of the bone, through which the tumour protrudes, the bony edge may be felt touching the base of the swelling, and much at one contracting it. This symptom, when feeling is able, added to a certain hardness and elasticity, and sometimes a faintly of pulsation, forms a pathognomonic mark, whereby fungus haemorrhoides of the dura mater may be discriminated from hernia of the brain, exterior fleshy tumours, aneurisms, cysts, and other effluvia which at first resemble them.

Probably, however, some variety in the symptoms prevails in different instances; for in the cases recorded by Walther there was no pulsation, nearly as called, but merely an obscure movement, or an alternate dilatation and contraction, arising from the influx of blood into the vessels of the diseased part: for tumours could not be so far from within the cranium, in the slightest degree; nor did the attempt close any of the effects usually observed to proceed from pressure on the brain. No pulsation could be felt in the neck, much less could the irregular edges of the bone around the tumour be distinguished. — *Ann. der Chir. & B. 1. p. 25—31, 57, 58. Berlin, 1826.*

Whatever tumours also were perceptible in the swelling. Walther is convinced could not be distinguished from them by the pulsation of the vertebral artery; because they were judged, as it were, as an aperture in the skull, and adherent to the dura mater beneath them, and to the superjacent pericranium, so that even in the dead subject they did not admit of being pushed at the least, more forwards without difficulty, and the employment of strong pressure. (Ibid. c. p. 57.)

Indeed, this tight connection of the tumour with the capsule, why suppose, perhaps, it was not brought on in these particular examples by external pressure, but also why the edges of the bone in which could not be felt; and the small size of the swelling, in relation to the magnitude of the swelling, being aneurism, in my opinion, for the swelling's not sinking towards under pressure. But I am far from being satisfied, with Walther, that force of the dura mater are in their nature always irreducible (see vol. ii. p. 322); and that, when he speaks of the connection of the diseased mass with the vessels of the skull; its connection by the bone; and its extension under as well as above the cranium. Here I think Walther is as strong in saying that mass of these things necessarily be reduced, as others would be in assuming that it is the contrary manner to be reduction. These reflections must chiefly depend upon the size of the swelling, in relation to that in the aperture in the skull.

Generally speaking, fungus haemorrhoides of the dura mater are very dangerous, as well on account of their nature as of the difficulty of curing them in any certain manner, and of the danger and external disease which they very frequently. Such as have a pedicle, the base of which is far extensive, which are now in those positions, or than much diseased in the surrounding bone, are, nevertheless, not very painful, and in persons who are in rather remote parts, and are in general regarded to be the least serious. These are the cases in which a cure may be attempted with a hope of success, though the operation is almost universally doubtful.

When the seat of the disease has been just pointed out, when the disease is of long continuance, and the brain already affected, nothing dangerous can be expected.

Craniotomy is the most simple means of cure, and

one which has manifestly succeeded in such practitioners as have mistaken the disease for an aneurism, or a fungus ossifer. The efficacy of this method has been further manifested, because the tumour when not very large, has sometimes been partly, or even wholly, reduced, without any bad consequence. This has no little shown in looking to expose accurately the true character of the disease, that, as might be imagined, the reduction only being attended with temporary success, and having no effect whatever on the original extent of the disease, the symptoms returned, and tumours were again the nature of the aneurism was discovered. There is a fact in the memoir of M. Louis, which tends to evince that good effects may sometimes be produced by compression judiciously employed. A woman brought to the birth, of the growth by symptoms attended by a tumour of the sternum, having remained with her head for some time in the same way as the tumour, found the swelling so suddenly reduced, without any ill effects, that she thought herself cured by some means. Compression, artificially kept up by means of a piece of tin bound to her body, prevented the pulsation of the tumour again. The pressure, however, not having been always very strict, the erysipelas very soon and then returned, while the tumour was in the act of being depressed again, and then afterwards cured, on the swelling having assumed a solid pressure. The symptoms were therefore occasioned by the irritation which the tumour suffered, in passing the incision against the opening through which it protruded. The patient lived in this state nine days, having every now and then fits of insensibility, in one of which, attended with hicough and vomiting, she expired.

As long pressure cannot be depended upon, the following method may be tried. In cutting through the cranium with a knife, which is certainly preferable to sawing, the action of which is very tedious and painful, and can never be limited or attended with any degree of precision. A circular incision may be made through the scalp covering the tumour, and the flap dissected up, and reflected as in solving all the best circumstances like view. Then with trepan, repeatedly applied, or with wire would be better, Mr. Hey's saw, all the toughs of the bone should be carefully removed. Now, if it be true, that the vessels of the skull are chiefly concerned in the supply of the diseased mass, we see that the source of its growth must be destroyed by the foregoing proceeding.

The tumour, thus disengaged on all sides, may be cut off with a scalpel; and such arteries as third much should be tied. Then instead of applying caustics, as sometimes advised, perhaps it would be better to remove every part of both layers of the dura mater immediately under the situation of the aneurism. By this means, and the removal of the surrounding bone and tissue, all chance of the regeneration of the tumour would be prevented. In ascertaining the existence of a fungus of the dura mater, it is certainly an interesting point to know whether the tumour has an intimate vascular connection with the dural and pericranium, as asserted by Walther, and some other respectable authorities; though the importance of the information on this subject to the practitioner is seemingly lessened by his being aware that it is necessary always to begin with moving away the bone in the immediate vicinity of the diseased mass. In the *Journal* of 1810, vol. ii. Walther found the pericranium thickened by a considerable extent around the disease, and closely connected with the tumour by vessels. — (Ibid. vol. ii. p. 164.)

When the disease is aneurismal, and its pulse small and narrow, no mistake happens, we should not hesitate to cut it off.

This method is admirable in trying the case with a scalpel; a plan which could not be executed without dragging, and seriously injuring the dura mater; and the fatal effects of which I saw exemplified in the case of a young man, years ago in St. Bartholomew's Hospital, and was repeated upon in the late Mr. Jameson. However, it is also preferable to remove, when cause great pain, but very often contraindicated. In preparing the extraplanum, we should remove no whole extent of the cranium, and, if possible, be run, even though it may extend as deeply as the diseased part of the dura mater. This step must not be delayed, for the danger will continue to increase as we go on to effect the cure, become incurable, and even mortal. It is likewise

decides that we must impute the income which attended the treatment of the Standard Ackerly, of whom *Melania Austriaca* develops another instance. The same income was attended with inadmissible inequalities, which no remedy could affect. It was proposed to him to form the standard, in operations to which he consented. This proceeding brought into view, under the name, a *Phryganea* *paucicornis*, the destruction of which proved a permanent cure of the violent pains which the stomach had sustained. It is not mentioned in the case whether the inferior layer of the daily excreta was healthy or not, but there is foundation for believing that it is the excretion of these materials be overlooked in time, and foul residues be pursued, as to the instance past cited, success would often be sought. Indeed, reason would suggest this means; in fact the disease is not endemic, it is necessary to expose a small number, some of the daily matter.

It appears to me, however, that trespassing can never be warranted, unless the owner can be indicated by some external change. I saw my late master, Mr. Hadden, trespass first for a more lined path in one part of the land, on the suggestion that there was a stream under the tree, but no stream was found, and the cottage which reflected on the dark tunnel, and moved first.

No doubt, in some cases, the insurance will be considered, at least overlaid in the instance in which

Williter made an incision on the base of one of these fungi, in order to ascertain its nature: two pairs of blood vessels (one from several vessels of very large size) were thereby secured, and the further use of the knife discontinued.

M. Léniz has described many tumours which grow from the surface of the dura mater, while that membrane has been found, as after the application of the bistoury. They only seem to differ from the prolatas in not existing before the opening was made in the skull. Tumours of the dura mater should not be confounded with meningeal cysts. (See this article.) See, on the preceding subject, *Mém. sur les Tumeurs fontinales de la Dure-Mère*, par M. Léniz, in *Ann. de Chim. et de Méd.*, 1786, *Encyclopédie Méthodique*, *juris*, *Chir. art.*, *Dure-Mère*. J. N. Macbarnet, de *Tumours Capitis fungosae* and *Cervicis Cervicis cystis*. *Reprint*, 1712. *Journal, Pathologique*, t. 1, p. 467, &c. 1800. J. and G. Whistler, über die Schichten des Arachnoidei der menschlichen Hirnhaut. *Phil. Magaz.* 1811. In this work, the observations of M. Léniz are explained. PK = 1846 in *Journal für Chir.*, von C. Graef, &c. t. 1, p. 55, &c. 1850. Berlin, 1850. The latter brings 215 cases from the quarters of the Wundtoll, and of various figures contributed by from Léniz on several points, some of which I have noticed, as the foregoing facts.

For information of the data user, see *Handbook* of

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AN again so valuable and necessary to the perfection of our education as the ear itself have all the symptoms of surgery wanted for the preservation of its integrity, and the removal of the diseases with which it may be affected. What, indeed, would have been our lot, if nature had been less liberal, and not infused into us the sense of hearing? As Leibnitz has observed, we should then have been as mutilated for the want of instruction, a principal part of divine and human knowledge would have been closed; and, there being no improved communication of ideas, our little reason could never have approached perfection. Even our life itself, being as it were dependent upon all such bodies as surround us, would have been immediately exposed to surgery. The eyeight serves to render us conscious of objects which present themselves before us, and when the judge there to be harmful, we endeavor to avoid them. But to say nothing of our liability of being injured all sides at once, our eyes become of no service to us whenever they happen to be enveloped in darkness. The hearing is then the only sense that teaches us our safety. It warns us not only of every thing which is moving about us, but likewise of every thing which is moving about us, but likewise of every thing which is moving about us. Each are the inestimable advantages which we derive from that organ. Its importance when healthy places it nearly at the utmost efforts of surgery when diseased.—(See Sermon in *Memoirs for the Society promoting pure & free Protestantism*, by the Rev. John G. Campbell, D.D., 1793, p. 121, 122, of 128th.)

It is not in my Youth, even the diseases of the age were so seldom as might the greatest physicians and the most cautious opinions presented; and indeed how could any correct pathological information be expected from a student who had not given a complete and accurate description of the signs itself? Also, notwithstanding what has been here said respecting the studies of the ear, it is generally admitted that poor and equally deficient examinations and reserved history. Though Erasmus, Valerius, Vergara, &c. expelled some of the diseases which crossed this branch of surgery, they left a gross and obscure. Since their time, science has been enriched with the valuable discoveries of Celsus, Mercur, Scarpa and Casperini; the first two of whom demonstrated that the tympanum is filled with a liquid fluid, and not (as was previously held) with gaseous air; while the last two distinguished anatomists directed the guide with new and very valuable descriptions of all parts composing the labyrinth, especially the semicircular canals.

In 1762, the French Academy of Surgery agreed to

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that investigating the tactile sensations of so many sorts of emotions, the pathology of the internal ear, and the treatment of its diseases, are far, I may say, very far, from a high state of improvement. To further advance indeed were discouraging obstacles pointed themselves; the auditory apparatus is extremely complicated; the most important parts of it are hidden out of the reach of ocular inspection; the anatomy of the organ is perhaps not yet completely unveiled; the exact uses and action of several parts of it, especially the ear, are still involved in mystery; (the appearance of discharging the ear is a state of disease all too common frequently curable without it; and even when they are needed, and when vestiges of themselves are perceived, are traced in extraneous parts of the organ, the utmost is finally experienced in drawing any useful practical conclusion, because the natural uses of those parts, and the precise manner in which they contribute to the perfection of the ear, are not known to the most enlightened physiologists. We are very sorry to be able to point out to them as a weakness would be to use it, in examining the interior of a watch, to find some broken, and out of order, the exact state of which is the perfection of the instrument, we feel not first studied and comprehended. As last, the physiology of the ear is but very imperfectly understood; and, as Broussais remarks (*Ann. Chim. Phys.* t. 6, p. 17), it notwithstanding the progress made in optics, and the complete knowledge of the structure of the eye, a perfect explanation has not yet been given of the phenomena of this organ as an instrument of vision, no farther was that, with far more circumstantial information

The epidemics, and on removing it the next day several small round worms were observed upon it, and from that period all the symptoms disappeared. To this cure we shall all ascribe from Marignac. A young woman, somewhat fatigued, and tired long that when she was a girl a worm had been discharged from her left ear, that another one about six weeks ago had also been discharged very much like a small silicious vesicle. This event took place after every attack pain in the same ear, the forehead, and temples. She added, that since this she had been tormented with the same pain at the frequent intervals, and so severely that she often swooned away for two hours together. On removing the discharge, a small worm was discharged, of the same shape, but much smaller than the preceding one, and she was now afflicted with deafness and headachings on the forehead. After leaving the young Valentin no longer entertained any doubt of the verminous state of the tympanum being destroyed. He proposed the employment of an everted intubation in history such worms as so mentioned. For this purpose distilled water of St. John's wort, in which mercury had been agitated, was used. In order to prevent a protrusion of the tympanum, Marignac recommended the affected ear to be closed up when the patient goes to sleep, is restless and painful. If this be soon done, this, attracted by the application, will the worms withdraw, and while the patient is unconscious deposits their eggs in the ear. After, in speaking of worms generated in the middle ear, however, that there is no better remedy for them than the discharge of yellow matter, as reported on the ear several times a day. However, as this plan cannot always be pursued, as refusal or refusal to be of service may be tried, a few drops of whiskey to be introduced into the ear and retained there by means of a cotton ball of cotton. This method, which is not injurious to the lining of the passage, is fatal to worms, and especially to moths. When caterpillars, ants, earwigs, and other insects, have introduced themselves into the middle ear, they may be treated with a piece of fat smeared with honey; and when they cannot be dislodged by this simple means, they may sometimes be killed with a small piece of paper. In general, however, charred wool and expedient practice for the removal of small insects, such, beetles, and other earwigs, better than the middle ear, as to throw cold water into the passage with a proper syringe, by which insects they are forced out with the fluid. When the loud or violent vibration is usual, according to Mr. Richardson, the best mode of extraction will be by means of a syringe and injection of tepid water. For this purpose the palm of the syringe ought to be pressed gently against the side of the ear, so that it may occupy a little of the diameter of the tube as possible, and when the injection arrives at the eardrum tympanum, the respiration will force the head or other substance outward. It is to be rather large, if any perhaps remain at the entrance of the ear, where it ought to be extracted by means of a pair of forceps. [See Richardson's Illustrations of Acoustic Surgery, p. 43.]

A *White Savage* (May, 1928) was called in, a child about two years and a half old, who seemed whose case a publicist, and even the other a French being, had been placed in another child, and requested there for an interview, making complete delusion and extreme suffering. It then occurred never far from the car, I was followed by these things, which by close against the [presumably, entirely hidden by the wooden seats of the back of the car, and it was not, and, and] discharges. With a last point (the extractions were this really effort). Several enormous, perfectly spherical, and found in their catheters to remove the substances in other methods.

The business of buying horses is the pre-arranged scene, the most characteristically complete, as we may see in the fourth advertisement of *Polaris* (Hildenes, Cor. 12). After first surveying, we find both successively presented, and in this event all their industry produces a full of glass from the left ear of a Native girl, the picture itself herself abandoned to the most magnificent pose, with her extended to all the side of the boat, and bent, after a considerable time, was followed by a passage of the left side, a dry course, suggestion of the moment, multiple movements, and a better symmetry of the left arm. Hildenes comes

her by extracting the piece of glass which had remained eight years in her ear, and had been the cause of all this trouble. Although the extraction was never been very difficult, it does not appear that Hildanus found it necessary to practice an incision before the act, as some authors have advised, and among them Keesley, who has quoted the foregoing case. We have agreed with Lindesmith that such an incision does not seem likely to improve the effect very materially; for it must be on the inside of the external osseous capsule, which is in the largest part of the canal. The incision strikes us as an unnecessary violation of the integrity of the passage, for Keesley has observed that it is not such obliquity of the osseous canal as forms the basal thickness as a great impediment; for as it is flexible it may easily be made straight by moving the external os upwards. Hence Fothergill, of Acadia, pointed this specimen first prepared by Falcas Agneta, and it is very discoloured by Dr Lindesmith.—(Paris de l'École de Médecine, t. 9, p. 112, 113, 114.)

Wallerian relates a case in which a small ball, which had been pushed into the external auditory meatus, was by operation into the cavity of the tympanum, where it thence formed, which corresponded with the situation of the cranium.—*Ann. des Sciences Méd.* 1.7, p. 51.

B. *Statistical Analysis: Restricted with Rational or Random Detectors*

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The hydrogenated lipid, proteins of wax, if neglected, may ultimately produce absorption of the glycerium and other various tracheae. Thus, in any case, Hane and Chavasse found the heads of the nucleus separated from its level, partly destroyed and covered with the hardened carbon that had made its way into the Glycerium. (See *Dev. Arch.*, 1902, p. 20.)

*The symptoms (says Mr. Marshall) which are attributed to the imagination of the ovaries are pretty well known. The patient broods, has inability to bear, complaints of nausea, particularly at night or confined to bed in menstruation, and of heavy sexual life, the nervousness, stoniness of a laborer.

The quadrilateral is also the subject of such symptoms in support the existence of war; but the way remains a little different by explanation.

Any means capable of removing the imprisoned man may be adopted and attaching the man's wrists with warm wax or in the past, spindly and effeminate, and the only means necessary. At the same time, the (a)gent is immediately removed. — (Amory of the human fair, with a Preface to its History, by J. C. Smith, n.d., p. 72, 73.)

In order to remove its impurities from the car by its effort, a sponge capable of holding dirt and oil in its pores, should be employed; and the kind is joined with a good sort of sugar, care being taken to let it water in the natural direction, and not against one of the sides of the pithway. The sponge must also serve merely to wipe thoroughly into the car, as is taken the hygienic. As the final regulations with considerable regard, a small basin is to be held close up to the ear at the time of using the sponge, so as to catch the water and hinder it from wetting the patient's clothes. The food water prevented in this way, a turpentine is also to be fed over the shoulder. In general, it is necessary to direct

was restored, though it was lost again when the wound closed. Hence a new opening was made, and kept from healing by means of a piece of gutta. The patient was afterwards able to hear when the mouth was open.

The perforation of the tympanic process was not approved of by Morgagni; indeed, it never often fails, as both Magagnoli and Hagström have observed, on account of complete bony partitions preventing all communication between the middle cells; and sometimes the tympanic process, instead of being cellular, is perfectly solid: an instance of which is recorded by A. Murray.

14. Direction of the Labyrinth.

There are much more diversified than might at first be supposed, and if we select the two principal cases, and to depend upon the state of the bony of the ossicles, there are not less than seven different species of dislocation affecting the labyrinth. 1. Dislocation of the tympanic oval and fenestra towards, or upwards, backwards, &c. 2. Malposition of these apertures. 3. Malposition of the labyrinth. 4. Inversion of the cochlea in relation with the vestibule. 5. Alteration of the base of the cochlea. 6. Deficiency of the same fold. 7. Adhesion of the nerve of hearing.

No doubt disorders (and that kind of it which is frequently called the most difficult test) often arise from an amenable state of the periotic molles of the auditory nerve, or of the structure on which its filaments are spread. This affords an analogy to the dislocation of parts within, in which, though every part of the eye may seem to possess its natural structure, sight is lost, because the part is light only strikes against a paralytic or immovable retina. Mr. Saunders has noted this view of two deaf patients with the greatest care, but never discovered the least deviation from the natural structure. In the commencement of deafness from a paralytic affection of the auditory nerve, Mr. A. Cooper remarked, that the sensation of resonance was diminished, and when the deafness became deeper, was totally suppressed. And another particular symptom of paralysis of the auditory nerve, pointed out by the same author, is the patient's inability to hear the sound of a watch placed between the bony teeth.

With respect to the causes of a paralytic affection of the auditory nerve, they are mostly based in great debility, and some of these probably depend upon congenital imperfection of the nerve or brain itself. It seems, however, that a part of the causes to which we allude are mechanically, as an extrusion of blood, a distension, or an exposure; while others operate on the ear by sympathy, as in the case when deafness is produced by the presence of worms in the bowels.

Mr. Saunders remarks, that all the diseases of the internal ear may be denominated nervous deafness; the term, in this sense, embracing every disease, the result of which is in the nerve, or parts containing the nerve. Nervous deafness is attended with various conditions in different cases, some in the head or sensory kind, the occurrence of water, the hearing of a hoarse little, rattling of bones, howling of wind, &c. Other persons speak of a hearing noise, corresponding with the pulse, and increased by bodily exertion, in the same degree as the action of the heart.—(Saunders, p. 31.)

According to this author, there is a specific species of nervous deafness, attended with a sensation of some of the above-mentioned causes, and was once cured, in which the hearing was completely restored in three weeks, by a mercurial course.

Mr. Saunders observed several cases of nervous deafness, by restoring patients to low diet, giving them calomel freely, repeated doses of sulphate of soda, mustard, sometimes frictions, sometimes blisters, or, according to circumstances, and applying blisters behind the ears, at intervals of a week. The plan requires permanent use.

Electricity has been highly recommended for the cure of nervous deafness, though the prospect of benefit from it seems entirely depend upon the nature of the cause of the infirmity. It is observed to be sometimes useful in cases of locomotor paralysis of the auditory nerve; but it cannot be of any service where the Electricity takes the activity of the tympanum, or the muscular cells are contracted. It is less down as hearing, when the patients are very debilitated and subject to

vertigo, arising from the noise, great interference of blood to the head, &c.—(Edinb. and Sciences Med. t. 26, p. 124.) The evidence in favour of the efficacy of galvanism is still highly scanty and unsatisfactory.

Whether in certain cases of deafness from action of the auditory nerve the introduction of some injections into the cavity of the tympanum, through the Eustachian tube, will answer to the remedy used by a late writer, forms a question most debatable.—(Edinb. and Sciences Med. t. 26, p. 120, 122.) The effect of the nature of the matter, in some of these cases, may also merit further trial.

This article, I think, may be usefully concluded with a few general but sensible observations on the various kinds of deafness, made by a modern writer. According to Professor Rosenbach, all the disorders of the sense of hearing may be considered under three principal forms.

1. Deafness (Stetitio, Cytisus), in which the faculty of hearing associated sounds is completely abolished.

2. Hardness of hearing (Dysacusis), in which the faculty is so diminished, that several distinct sounds cannot be heard, without the assistance of a particular apparatus.

3. Alteration, or distortion of hearing (Paracusis), in which the faculty of hearing associated sounds in the natural way is imperfect for want of precision.

1. Deafness. Rosenbach distinguishes into four degrees, the first of which is marked by an absolute impossibility of hearing at all; the second, by a power of still distinguishing certain sounds, as murmuring, the voice, &c. The first is usually congenital, and a cause of idiocy.

The discrimination of these four degrees. Rosenbach considers of great importance, especially in relation to the deaf and dumb; because the pathology and cause of each with which these persons are sometimes gifted, is apt to be mistaken in the faculty of hearing. This fact is illustrated by some interesting experiments made by Flourens on deaf and dumb persons. (Voyage de Flourens aux Indes, t. 2, p. 32.) A deaf and dumb girl, who was a needlework in a work near the house-door, regularly gave notice whenever it was opened or shut. As the door was furnished with a little bell, which rang loud enough whenever the door moved to be plainly heard in the neighbouring room, and with the exception of this noise, no other noise or sound could be distinguished, Flourens was surprised at the circumstances. Numerous observations have the girl really knew about the movements of the door, he asked the bell to be rung with great force without the door being opened; the bell was perfectly unconscious of the noise. The bell was afterwards kept still, while a person entered and shut the door so softly, that Flourens himself could not hear it; yet the child instantly gave warning that somebody had entered. The inference was, that the child, on which she was conversed to her legs and back, certainly listened, which made her conscious of the motion of the door.

The discussion of the state of deaf and dumb persons has excited some false explanatory of the nature of the loss of hearing. Among other things, it appears, that complete deafness, whether congenital or acquired, more frequently depends upon normal alterations of the soft parts, than upon any interference in the formation of the bones. Thus, in the head of a person who had both deaf and dumb while living, Flourens found the auditory nerve diseased in size, while every other part of the organ was perfectly normal. Anatomists found the nerve harder than common. Dr. Hufschmidt, with an instance, in which the vestibulum was filled with a viscous substance.—(A case of internal deafness, in Mem. of the Med. Society, vol. 3, p. 4-15.) Dr. Murray and Marshall found the auditory nerve severely compressed by a shrinking. In some cases, I have found even part of the ear apparently so altered, that the deafness could not be ascribed to paralysis of the nerve. In others, the infinitely dependent upon, structure of the cochlea. In a third, the cavity of the tympanum and the vestibulum contained small portions of calcareous matter. He has also seen the tympanum filled with a thick, yellow lymph, or a thin fluid encased in calcareous cells. In the dissection of the head of a deaf and dumb person, Rosenbach noticed,

among other remarkable circumstances, a greater hardness of the auditory than of the facial nerve, and preternatural firmness of the malleus obliquus; thickening of the membrane of the tympanum, the bony roof of the cavity of the tympanum not thicker than paper; and just over the junction of the malleus with the incus the bony substance was so absorbed, that an appearance like that of membranous tissue resulted. The round cells, many of the tympanum, and the Eustachian tubes, contained a limpid yellow fluid. In the tympanum, the peritremum was thickened, forming small discoloured tubercles, which were of their natural structure. Nothing particular was remarked in the labyrinth.

In a small proportion of instances, the above degree of deafness has been traced to anomaly in the structure of the solid parts. Thus, Monro found the cochlea composed of only one stria and a half—(Op. cit. Acad. Regiae, 1791, t. 7, p. 422.) Valentin found the stapes adherent to the fenestra ovalis (De Aure Mammalia, cap. 11); and Reissner notices a case in which the ossicles were entirely missing—(Mémorial de l'Acad. de Turin, p. 57.)

In the first degree of deafness above described, which, when verified, must excite suspicion of serious inflammation of the organ and abolition of the nervous influence; and when stopped, indicates a complete cure of the function of the nerve, the prognosis is favourable. However, it must be recollected, that the degree of the disease, though only a partial imperfection of the organ and nerve can be supposed. On the other hand, when the latter degree is acquired, there is more prospect of relief, because merely a partial alteration in the solid parts is to be supposed.

2. *Hardness of hearing.* Broussais also distinguishes several degrees of what is termed hardness of hearing. In the first, the patient cannot hear a clear voice, and especially high tones, but can perceive, though it is true, not with very distinct notice, articulated sounds, when the voice is a good deal raised. In the second degree, he hears and distinguishes both high and low tones very well, and also words, but only when the voice is somewhat raised.

These two cases are better understood, inasmuch as it is tolerably well ascertained that the immediate cause of the deafness is some alteration in that part of the organ which serves as a conductor for the vibrations of sound, or else an increased sensibility of the nerve of the internal ear being in other respects right.

Among alterations of the conducting parts of the organ, Broussais distinguishes:

1. A total obliteration of the tympanic membrane, or, at least, its perforation, or complete absence. These cases have almost always been attended by a suppurative inflammation, the patient only hearing when some solid bodies are placed between the eardrum and the bull peritremum of sounds does not appear to be much lessened when the ear is perforated.

2. Diseases of the cavity of the tympanum, as—obstruction of its parietal membrane, thickening of its parietes, or collection of blood, pus, or other fluid, in its cavity. Broussais thinks there can be no doubt that inflammation and suppuration in the tympanum are much more frequent than is generally supposed; the former affection being often resolved by a slight access of inflammation. In describing aged subjects, he has frequently noted the appearance of the tympanum thickened and opaque, and he could only impute this appearance to previous inflammation.

After detailing a few structures of the system of perforation within the tympanum, and a few observations on noise and vertigo as they in themselves carry Broussais into the hardness of hearing, considered with nervous erasibility, is the treatment of which, even, he admits upon the advantage that would result from a knowledge of the particular species of morbid alteration prevailing in the patient. But as nothing very certain can be made out of this point, and still less can we know their directions of force, than the different causes either in a combination of them, or in the part, or in a partial paralysis of the auditory nerve, the exact nature and time of which are quite unascertainable, this absolutely necessary to which, only in the progress of the disease, attention is paid. This disease will be far different, but, if the patient has been previously very sensible to the sound of the voice, or sound in general; when

if the power of hearing has been lost all at once, and without any mark of inflammation; &c. If the affection coincides with other nervous diseases.

3. *Alteration in Direction of Hearing.* Between the most perfect hearing, congenital or acquired, and this point of disturbance of the faculty of hearing, Broussais observes there are a great many degrees, the cause of which is the most difficult to comprehend, as the constitution of structure, which enables every part to perform its functions with freedom and precision, are not yet made out. If, even so, it were in our power to determine what is truly the regular structure of each part, we should then be furnished with a means of judging correctly of the anomalies of function, the changes in which would be indicated, gave efficacy as in the eye, by studies of organization, similarly in the same way as we judge of the modifications which the trunk of vessels must undergo at the bottom of the ocular artery, by the diameter of the vessels of the common or less, or the constancy of the other innervation.

In the present state of physiological and pathological knowledge of the ear, therefore, Broussais observes that little can be attempted with regard to a scientific classification of these cases of altered or disturbed hearing. As the cavity of the tympanum makes constant use of the parts which have principal influence over the vibratory motion, and in that share is the propagation of vibrations and sounds, their faulty condition must be chiefly the subject for consideration. And under their numerous defects, traced by observation, and already specified in the foregoing columns, Broussais particularly calls the attention of the reader.

1. To alterations of the membrane of the tympanum, whether proceeding from congenital malformation, or disease, or from thickening, contraction, perforation, or inversion of the same part.

2. To the induration of some part in the cavity of the tympanum, more frequently produced than is commonly supposed by obstruction of the Eustachian tube. In most new-born infants, Broussais has also found the cavity of the tympanum filled with a thick, elastic gelatinous fluid, which for some days is non-absorbed, and is probably the cause of the indurative excited by new-born children to sounds, which are even as it seems as to be offensive to the ears of an adult.

3. Alterations of the membrane of the fenestra ovalis, such as its imperfect formation, or erroneous situation, its thickened state, &c.

But it is remarked by Broussais, that as the difference in the intensity of sound may occasion a modification in the sensation of the ear, the merely conducting parts of the auditory apparatus need not be forgotten, as the external ear and the ossicles influence extension, which regulate the quantity of sonorous waves striking the auditory nerve. However, the transformations of the ossicles and the state of the eardrum, some secretion within it, are observed by Krüger and Lentin (Ueber das Gehör, Göttingen, 1799, 8vo, 1799) to have more effect on the hearing than defects of the middle itself, the whole of which, as we have stated, may be lost without any material deafness being produced. Lastly, Broussais calls our attention to the nervous action or influence, which, whether too great, or too small, may equally render the hearing dull; and some useful observations on the case just now by Broussais, from attending to the patient's sensibility—(see Broussais, *Opuscules*, t. 5, p. 224, &c. *Journal de Médecine*, 1800, t. 10, p. 100; *Journal de Médecine*, 1801, t. 11, p. 100; *Journal de Médecine*, 1802, t. 12, p. 100; *Journal de Médecine*, 1803, t. 13, p. 100; *Journal de Médecine*, 1804, t. 14, p. 100; *Journal de Médecine*, 1805, t. 15, p. 100; *Journal de Médecine*, 1806, t. 16, p. 100; *Journal de Médecine*, 1807, t. 17, p. 100; *Journal de Médecine*, 1808, t. 18, p. 100; *Journal de Médecine*, 1809, t. 19, p. 100; *Journal de Médecine*, 1810, t. 20, p. 100; *Journal de Médecine*, 1811, t. 21, p. 100; *Journal de Médecine*, 1812, t. 22, p. 100; *Journal de Médecine*, 1813, t. 23, p. 100; *Journal de Médecine*, 1814, t. 24, p. 100; *Journal de Médecine*, 1815, t. 25, p. 100; 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Structure, and accidental Compounds, See Lond.
1857. But see *Monomers* M. 6. and *Isomers* I. 2, 3, 200.
Paris, 1855. *Rational, Exact and Pathologic*
Organic Physiology, in French, Compendium de la Physiologie
du Systeme, 265, p. 1, p. 17, See Paris, 1856. J. H.
M. Ward, *Traité des Maladies du Système de la Circulation*,
2, 1 vol., See Paris, 1855. T. Buchanan, *An Elementary*
Representation of the Anatomy of the Human
Ear, 2d. Ed., 1854. Also, *Instrumentation of Acoustic*
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also *See* *Index* on *Isomers* of the *Isomers* *See*, p. 1,
p. 100, M. D. Translated by Professor Smith, of
Harvard, 1855. 244 pages on the *Isomers* *See*.]

The causes of erythema are falls, blows, sprains, etc., which occasion a rupture of the blood vessels on the surface of the body, and a subsequent effusion of blood, even without any external break of continuity. Erythema is one of the symptoms of a contusion.—(See Contusion.) A considerable erythema may be caused from a very slight bruise, when the ruptured vessels are capable of pouring out a large quantity of blood, and particularly when the parts contain an abundance of loose cellular substance. In general, erythema does not make its appearance immediately after the blow or sprain, but sometimes waits several hours after the application of the violence; at least, it is not till this time that the local, blue, and livid colors of the skin is most conspicuous. A thick vein, which is only an erythema, is always soon discolored six or eight hours after the receipt of the blow.

In the article *Bleeding*, we have noticed how an epistemic *why* can arise from the focal getting out of the way (in the adjacent cell) of the sentence.

Common uses of emulsions may generally be easily cited by applying the standard formula, and an emulsifying base of itself does not add particular risk. The most typical applications are emulsions of the water-soluble emulsifying agent, run through, and the liquid emulsion, such as:

The object is to meet this aim, and to provide the atmosphere of the experimental field.

In cases of occupations, I have seen such persons lead the practice of increasing collections of extraneous food by means of almsgiving, that the plan of examining it by an analyzer seems to me to be unnecessary. When an animal is made and as is obtained the portion of blood which cannot be prepared in upon parasites, and extensive infestation and suppuration are the frequent consequences.

The quick and powerful action of the absorbent results in rapid extrusion of blood, one pulse in 10 seconds, and in 10 minutes the patient is no longer called in question, when we find no record in medical journals, that the largest hemorrhages are thus speedily dissipated and removed, after the operation of tying the arteries, from which each hemorrhage arises.

[illegible]

ENTRUSTMENT. (From *Entrust*, to trust.) A casting out or an revulsion of the eyes.

According to reports, there are two species of this genus, one provided by an American wildlife official and a young of the species which not only makes their appearance in the market, but also breeds them in the country (see report). The other species from

2. retraction of the skin of the eyelid, as in weeping, by which the edge of the eyelid is first rendered far more dense than the eye, and afterward turned respectively out, together with the whole of the affected eye.

The marked swelling of the lining of the azygos, which causes the first species of tetraplegia (gelling out of joints) consideration of a similar infection (endocarditis) and not, arises mostly from a congenital lack of the venous, afterward increased by chronic chronic endocarditis, particularly that of a valvular nature, or mixed, endocarditis, or else the disease originates from the small-pox, affecting the eyes.

While the disease is confined to the lower eyelid, as it most commonly is, the lining of this part may be observed rising in the form of a semicircular fold, of pale red colour, like the tarsal granulations of psoriasis, and intervening between the eye and eyelid, which hinders it in some measure from closing. When this swelling is accompanied by the rising of both the eyelids, the disease assumes an angular shape, in the centre of which the eyelid seems sunk, while the circumference of the ring swells and crums the edges of the two eyelids so as to cause both great irritation and deformity. In each of the above cases, on pressing the sides of the eyelids with the point of the finger, it becomes manifest that they are very capable of being elongated, and would readily yield, so as strictly to cover the eyeball, were they not prevented by the interesting swelling of their membranous case.

Besides the very considerable deformity which the above produces, it causes a permanent dimming of both the eye and the skin, and, when it occurs, a distension of the epinephal, frequent spontaneous attacks of chronic catarrhal, incessant itching of the skin, and, finally, opacity and immobility of the cornea.

[illegible]

Although in both species of ectoparasite the lining of the abdomen is usually sensitive, yet the response is usually stronger in *Ichneumon* than in *Phaenocarpa*. For in the first the skin of the eyelets and adjoining parts is not disturbed, with acids, and by pressing the external eyelid with the point of the finger, the lid trembles with ease over the eye, where it is not so for the latter species, although sensitive. But in the second species information, besides the above-said, consists also of contraction of the skin of the eyelets or adjacent parts, because often it needs to cover the eye with a muscular fold, by pressing upon the latter part with the point of the finger, it does not give way, so as completely to cover the globe, or only yields, in a slight way, for in this manner, as it does not move in the least from its normal position, by means of the information of this kind, having been so accurately destroyed that their eyes can become adherent to the ends of the antennae.

Mr. Graham expressed a plan to present an

apical inflammation, accompanied with contraction of the integuments of the eyelid, but without any marked disfigurement. It is described by him as usually taking place after a long continuance of lachrymation, and proceeding from the contraction, contraction, and thickening of the skin, "the result of the passage of the vitreous secretion over it, and which, by dragging on it, causes the irritation."—(In the *Operative Surgery of the Eye*, p. 50-55.) This form of the disease, according to Mr. Gifford, is rarely attended with such a thickening of the lower lid as requires it to be removed with the knife or scissors; for it subsides with the removal of the complaint.—(P. 66.)

According to Scarpa, the cure of ectropion cannot be accomplished with equal perfection in both its forms, the second species being, in some cases, absolutely incurable. For, as in the first species of ectropion the disease only depends upon a partial thickening of the internal membrane of the eyelid, and the treatment mainly consists in removing the redundant portion, art possibly may effect a cure of it. In the second species, the chief cause of which arises from the loss of a portion of the skin of the eyelid or adjacent parts, which loss is known either to be congenital, or acquired, and is not capable of effecting a perfect cure of the disease. The treatment is confined to removing, as much as possible, such complaint as results from this kind of exposure, and this may be done either by means of astringent treatment, according to the loss of skin of the eyelid in the first grade. Cases in which no such skin is deficient, that the edge of the eyelid is adherent to the margin of the orbit, Scarpa considers as incurable. Now for the reasons he reaches, he thinks, that always to be estimated by reasoning to what point the eyelid admits of being retracted, or being gently pushed with the end of the finger towards the globe of the eye, both before and after the employment of such means as are calculated to effect an adhesion of the skin of the eyelid, for it is into this point, and no further, that art can reduce the eyelid, and consequently keep it in place.

When the first species of ectropion is recent, the finger's swelling of the lining of the eyelid not considerable, and consequently the edge of the eyelid not much turned out, and in young subjects (for in old ones the eyelids are so flaccid, that the disease is incurable), Scarpa prescribes desloughing the flaccid surface of the internal membrane of the eyelid by the repeated application of the astringent mixture. Mr. Gifford teaches the flaccid portion of the conjunctiva every four days with a probe dipped in sulphuric acid, and gently applied every day, or every second day, the salivary of copper, at the same time yet creating some transverse incisions, which he also employs to cause pressure from contraction of the skin independent of any astringent, and which I shall presently notice.—(On the *Operative Surgery of the Eye*, p. 75.) In recent cases, where the patient is weak and irritable (or a child), Scarpa recommends the treatment with simply applying every day the liniment of opium, which often a time is to be strengthened by the addition of opium. To the relaxed conjunctiva he afterwards applies exclusive eyelashes, and last of all the use of silver and nitrate of mercury. When the part is hard and relaxed, the employment of cauter is preceded by scarification.—(Letter, &c. 2, p. 136.)

For removing the considerable and immoderate size of the first species of the disease, Scarpa and Gifford are agreeable for cutting away the whole or the flaccid swelling closely from the vascular membrane, on the inside of the eyelid. The following is Scarpa's description of the operation.

The patient being seated with his head inclined backwards, the surgeon, with the index and middle finger of his left hand, is to keep the eyelid steadily fixed, and holding a small pair of scissors with the convex edges in his right, he is to cut off the whole redundancy of the internal membrane of the eyelid as near to the base as he can. The same operation is then to be repeated on the other eyelid, should that be affected with the same disorder. If the excision be effected with a sharp edge that is curved to exactly imitate when the operation is made be raised as much as possible with Scarpa, or a double-pointed hook, and dissected off at its base, by means of a small bistoury with a convex edge. This last mode is preferred by Scarpa to the use of scissors, and I confirm that it has always

appeared to me the most convenient. The bleeding, which occurs at the beginning of the operation as if it would be copious, stops of itself, or as soon as the eye is bathed with cold water. The surgeon is then to apply the dressings, which are to consist of two small compresses, one put on the upper, the other on the lower arch of the orbit, and over these the sitting liniment, in the form of the emulsion, or an ointment as it compresses and replaces the edges of the eyelid, in order to make them meet the eye. On the first removal of the dressings, which should take place about twenty-four or thirty hours after the operation, the surgeon will find the whole, or almost the whole, of the eyelid in its natural position. The treatment should afterwards consist in washing the skin of the inside of the eyelid twice a day with warm water, or barley water, and contact, rest, until it is completely well. If towards the end of the cure the vascular action assumes a dangerous appearance, or the edge of the eyelid seems to be too distant from the eyeball, the wound on the inside of the eyelid must be re-cut several times with the appropriate instrument, for the purpose of destroying a little more of the membrane lining, so that when the inflammation subsides, a greater contraction of it may take place, and the edge of the eyelid be drawn still nearer to the eye. Proper steps must be taken, however, for restoring the principal cause, in which the ectropion depends, particularly chronic ophthalmia, a relaxed and morbid state of the conjunctiva, &c.—(See *Op. Oculi*.)

In England the extension of the flaccid eyelid portion of the conjunctiva, in cases of ectropion, has been very much misapprehended for the employment of cauter. The difficulty and almost total ineffectuality of dissecting off every particle of the flaccid membrane under the practice of cauter is much less certain than the treatment with cauter. Thus we see that Scarpa, who is not an occasional failure, and the necessity of his having recourse to the operation. He does not allow the employment of cauter to follow the use of the latter.—(Alat. des Yeux, p. 165.) In the ectropion, from a relaxed flaccid state of the conjunctiva, the employment of permanent ophthalmia, the Voss's ligature with a light careful application of the astringent mixture to the whole granulated surface. The eyelid part is then to be returned, and secured in its place with a compress, and straps of plaster as a bandage. When the eye is closed, the same things are to be kept up, and in the course of a few days the tendency to protrude will disappear.—(On Diseases of the Eye, p. 168.)

In the second species of ectropion, or that produced by an accidental contraction of the skin of the eyelid, or neighbouring parts, Scarpa observes, that if a contraction of the conjunctiva has proved capable of turning the eyelid, the removal of a piece of the internal membrane of the part, and the cicatrix which will follow, will also be capable, for the same reason, of bringing back the eyelid into its natural position. The same nothing can remove the thick skin, the shortened end of the whole eyelid, in whatever degree it comes, must always continue, even after any operation the most judiciously executed. Hence the treatment of the second species of ectropion, he says, will never succeed so perfectly as that of the first, and the eyelid which will be drawn back shorter than natural, is prevented by the quantity of cicatrix which will follow. It is now that, in every case, the extension seems greater than it should be, in regard to the small quantity of skin lost or removed; for when the disease has once begun, though the contraction of the skin may be the cause of the turning of the eyelid, it is a different, with the turning of the eyelid, which never sets in motion, at last brings on a complete extension of the part. In those cases the eye may be misapprehended with the same as in extending to the same extent; to offer the finger's swelling of the external membrane of the eyelid has been cut off, and the edge of the part approximated to the eyelid, the shortening of the eyelid remaining after the operation is not taken, that it will be considered as nothing in comparison with the disease and the consequence considered by the ectropion. However, therefore, the removal of the skin which would extend, and the consequent shortening of it, are necessary to prevent the turning again and turning of the eye if not removed, at least moderately, Scarpa directs the surgeon to cut away the internal membrane of the eyelid

lid, as already explained, so as to produce a line of adhesion on the inside of the eyelid. In irritable cases of ectropion, in which the lining of the eyelids has become hard and callous, Scarpa applies to the external eyelid, for a few days before the operation, a soft bread-and-milk poultice, in order to render the part flexible, and more easily separated than it could be after longer rigid state.

The division of the cicatrix which has given rise to the swelling and eversion of the eyelid, as Scarpa observes, does not procure any permanent change in the part, and consequently it is of no use in the cure of the present disease. We see the same eversion occur after deep and extensive burns of the skin of the palm of the hand and fingers, whatever pain may have been taken, during the treatment, to keep the hand and fingers extended, no sooner is the contraction than completed, than the fingers become prominently bent. The same thing happens after extensive burns of the skin of the face and neck. — FARRIES, an Achromaticist, who well knew the necessity of making a small scar cut in the skin of the eyelid, for the purpose of reducing the cicatrix and external tumour, as the best expedient, to correct them, with sufficient pleasure, applied to them and the eversion, and lost sight of together. Whatever advantage may result from this practice, the same degree of benefit may be derived from using, for a few days, a bread-and-milk poultice, afterwards dry eversion, and lastly, the cutting based, as we get on, to divide the shortened eyelid in an opposite direction to that produced by the cicatrix; a position which Scarpa thinks should always be successfully tried before the operation is determined upon.

The surgeon, with a small convex-pointed bistoury, as he pulls an incision of sufficient depth into the internal cicatrix of the eyelid, along the tarsus, carefully avoiding the situation of the palpebral lachrymæ. Then with a pair of scissors, he should raise the flap of the divided lachrymal membrane, and continue to divide it with the bistoury from the deepest parts all over the inner surface of the eyelid, as far as where the tarsus passes this part, to be continued over the front of the eye, under the name of conjunctiva. The operation being thus accomplished, the membrane is to be raised still more with the Scissors, and cut off with one or two strokes of the bistoury, at the lowest part of the eyelid. The conjunctival bandage, to keep the eyelid opened, as it is applied as above directed. On changing the dressings, a day or two after the operation, the eyelid will be found, in a great measure, relaxed, and the disarrangement which the disease caused greatly avoided. The operation is rarely followed by bad symptoms, such as swelling, violent pain, and inflammation. However, should they occur, the bleeding may be relieved by means of an opiate (Opium), and as for the pain and inflammation, attended with a great obstruction of the eyelid opened upon, these symptoms may be cured by applying a poultice, or bags filled with moistened linen, as the same time applying internal anodynes, until the inflammation and swelling have subsided, and suppuration has commenced on the inside of the eyelid on which the operation has been done. After this the treatment is to consist in washing the part twice a day with warm water and vinegar, rose, and honey, in washing the wound a few times with the aqueous solution, in order to keep the cicatrization within certain limits, and to form a permanent cicatrix, proper for restoring the eyelid against. — (Scarpa and Malabarghi 1784.)

In cases in which the eversion is considerable, Mr. W. Adams has never found the simple division of the cicatrix, as practised by Scarpa, sufficient to effect a radical cure, and he therefore tried a new radical operation. In his first attempts, as employed a very shallow curved bistoury, the point of which he directed along the inside of the eyelid, in the outer angle, symmetrical and upwards, as far as the point of reflection of the conjunctiva would allow. Blotting passed it through the whole substance of the eyelid, and the integuments, and cut upwards through the tarsus, making an incision nearly half an inch in length. With a curved pair of scissors, he next supposed a piece of the edge of the tarsus, about one-third of an inch in width, and he afterwards removed with the same instrument the whole of the diseased conjunctiva. When the bleeding had ceased, Mr. W. Adams passed a needle and ligature through the whole substance of the eye divided por-

tions, and brought them as accurately into contact as possible. Finding, however, that the depth of incision had been left at the lower part of the cicatrix, he employed in future operations, instead of the curved, a pair of straight scissors, with which he cut out an oblong piece of the lid, resembling the letter V. Lastly Mr. W. Adams has tried an oblique incision to leave about a quarter of an inch of the lid adjoining its external angle, and after shortening the part removed in some way he brings the edges of the cicatrix together with a suture. — (See *Practical Surgery* above under Ectropion, &c. p. 1 and 2, Lond. 1812.)

On the subject of the foregoing proposal, Mr. Ross observes, "What Mr. W. Adams says, with a view of removing the whole of his eye method, about the frequent recurrence of cicatrix, when the conjunctiva is simply cut out, is a gratuitous assertion, contradicted by experience. I have already in a very great number of cases undertaken the cure of cicatrix in the common way — the operation always succeeded in such as the disease, or other circumstances of the disease allowed; and I have not yet observed any instance in a relapse." — (Farrès, *Gazette de Londres* in 1814, in *Parallèle de la Chirurgie Française avec la Chirurgie Française*, p. 384.) If this new operation, however, will cure the cicatrix, caused by the instrument of dissection, as its various directions, as proving great improvement, as the experience of Mr. Tardieu confirms (*Synopsis of the Diseases of the Eye*, p. 225), it is clear that though it may not be necessary in ordinary cases, in such cases will be entirely lost. Mr. Guthrie acknowledges that it may be highly useful in the cicatrix from the contraction of a cicatrix — (On the Operation Surgery of the Eye, p. 71.) The intended permanent cure of course is denied, as it is to the effect of prevention.

In the form of ectropion described by Mr. Guthrie as arising from a laceration, and contracted state of the lachrymæ of the eye, but without any cicatrix, he observes that the lachrymæ are, first, to remove the contraction of the skin externally; — 2dly, to remove and bring the eyelid to its proper situation, third, to neutralize curvature of the cartilage has been overdone, and the chronic inflammation removed. For fulfilling the first indication he recommends washing the external part with warm water, as to leave the skin as much as possible. It is then to be carefully dried, and respectfully anointed with the ung. oleo, for three or four days. Being thus protected from the atmosphere, it becomes softer, and it is a favorable state to yield to mild excitation. For accomplishing the second indication, Mr. Guthrie applies the sulphuric acid, the eyelid having been changed so as to prevent its slipping, the conjunctiva is to be gently wiped dry and everted as much as possible, so that the part where it begins to be reflected over the eyelid may become. An assistant is to raise the upper eyelid a little, and the patient is to look upwards. The third end of a constant silver probe is then to be dipped in the sulphuric acid and pushed over the conjunctiva, so that every part of it may be touched with the acid. The outer point of the probe is to be carried so far as where the lachrymæ begins to be reflected over the eyelid, but no farther. The palpebral lachrymæ, conjunctiva, and tarsus are to be treated; but the external angle, as well as every other part, except what is reflected over the eye, as to be carefully washed. The acid will then be applied, portion of the conjunctiva where; and in order to prevent the acid from affecting the eyelid, a stream of water is now to be directed over the eyelid with an elastic gun syringe. If the conjunctiva should not be turned sufficiently white, as supposition may be required. The use of the acid is to be repeated every fortnight; "and what applied in the manner directed it does not cause a slough, has a general contraction of the part, which is, however, only perceptible after two or three applications, by its effect in flattening the lid, which gradually begins to take place. After six or eight applications, the cure will be known that half accomplished, and in most cases of this species of cicatrix, the thickening of the conjunctiva will have subsided." The ung. oleo is to be constantly applied to the skin, and the ung. indur. 2dly, in the proportion of one part to four or six of the ung. oleo, is the edge of the eyelid. After the eyelid has returned two-thirds of the way towards its natural position, the interval between the applications of the acid must be longer, lest the contraction within the eyelid be carried too far, and it is to be repeated within

dead. After the operation is closed, the lips of the wound partly remain, and demand the use of the tag, by drag, stir, or other gentle stimulants.—*See* *Niemann's Chirurgische Heilmittel* (Engl. transl.) 2d. ed. cap. 6. *Richter's Anästhesie der Wundoperationen*, &c. 2. p. 473, &c. *Wunder's Manual de Plombage*. Peltier, *Recherches sur le sang de Malade de la Peau*. *See* W. Adams, *Pract. Observ. on Escharotics*, or *History of the Eschar*, with a Description of a new Operation for the Cure of that Disease; in, the modes of forming an artificial Eschar; and on Catarrh, *Ann. Lond. Med. M. Suriname*. *Mémoire de la Société royale de médecine* sur l'usage des Escharotiques, par Peltier, in *Ann. de Chimie, de Médecine, et de Pharmacie*, t. 13, p. 156, &c. *Eschar.* It was in this manner, that the proposal of forming a portion of the inside of the eyelid for the cure of *ophthalmia* was first made. More may also be found the best historical account of the different methods of treatment, which have prevailed from the earliest periods of surgery. Consult also *Paracelsus de la Chirurgie* (English trans. in *Chirurgia Practica*, par P. J. Roux, p. 289—302, Paris, 1815). G. J. Bari, *Lehrb. von der Augenheilkunde*, &c. 2. p. 155, &c. *Ann. Med.* 1817. *Baron*. Thiersch, *Synopsis of the Diseases of the Eye*, p. 324—330, &c. *Ann. Lond. Med. M. Suriname*, *Trans. and Med. Soc. York*, &c. 38. G. J. Gallie, *Lectures on the Operating Surgery of the Eye*, &c. Lond. 1822.)

ECZEMA, or *Erkema* (from *ekto*, to be out of), is characterized by an eruption of small vesicles on various parts of the skin, usually close or crowded together, with little or no inflammation except their bases, and unattended by fever. It is not contagious.—(*Baron's Synopsis*, p. 223, ed. 2.) There are several varieties of this disease, the most remarkable of which is the *eczema calycis* from the irritation of mercury. This form is attended with quickened pulse and a white tongue; but the stomach and bowels are not materially disturbed.—(*See* *Mercury*.)

EFFUSION, in surgery, signifies the escape of any fluid out of the vessel or vessels naturally containing it, and the sediment or portion which is the cellular substance, or in the substance of parts. Thus, when the skin is wounded, blood is sometimes effused from the vessels into the cavity of the wound; in cases of false aneurysm, the blood passes out of the artery into the interstices of the cellular substance; in cases of hernia or peritonitis, the serum flows from the bladder and enters into the cellular membrane of the peritonium and scrotum; and when great violence is applied to the skull, blood is effused even in the very substance of the brain.

Effusion also sometimes signifies the natural secretion of fluids from the vessels; thus surgeons frequently speak of the sanguineous lymph being effused on different surfaces.—(*See* *Exudation*.)

ELECTRICITY. Among the aids of surgery, electricity must hold a conspicuous and important situation. It has, however, but with a faint glow shined with remedies too much cooled up and too indifferently employed; that of having fallen into an undesired degree of neglect.

Whatever its effects may be on the system, it certainly possesses this advantage over other topical remedies, that it may be made to act on parts very remote from the surface.

Electricity, as a topical remedy for surgical diseases, is chiefly used in anæsthesia, hæmorrhage, some chronic irritations and abscesses, weakness from spasm, or convulsions, paralysis, &c.

In cases of suspended effusion, electricity is sometimes an important auxiliary for the treatment of the vital functions.—(*See* J. Curry's *Obs. on Effusion* (Engl. transl.) 2d. ed. 1815.)

ELEVATOR. An instrument for raising depressed portions of the skull.

Formerly the common elevator, now generally preferred by all the best operators, several others have been invented; as, for instance, the tripod elevator, and another which was first devised by M. J. L. Petit, and afterward improved by M. Loupe.

EMBRICATIO ALUMINIS. E. Aluminis ʒi. Acet. spiritalis roris leuissimæ, sig. Rec. For children and diseased joints.

EMBRICATIO AMMONIÆ. E. Liq. ammon. ʒi. Aluminis sulphurati ʒss. Sp. lavandulæ ʒss. M. For sprains and bruises.

EMBRICATIO AMMONIÆ ACETATÆ CAMPHORATA. E. Liq. camph. liq. ammon. acet. ʒss. ʒi. Liq. ammon. ʒss. M. For sprains, bruises and chilblains, not at a time of suppuration.

EMBRICATIO AMMONIÆ ACETATÆ. E. Liq. ammon. acet. liq. ammon. sig. ʒss. M. For bruises with inflammation.

EMBRICATIO CANTHARIDIS CUM CAMPHORA. E. Ther. canth. spirit. camph. sig. ʒi. M. This may be used in any case in which the skin is to be irritated. It should be remembered, however, that the absorption of cantharides will sometimes be so violent.

EMBRICATIO. (From *embere*, to be in, and *embere* out.) The operation of cutting hollows, in order to extract the fluids.—(*See* *Cantharides* (Emulsion).)

EMPHYSEMA. (From *emphos*, from *emphos*, to swell.) A swelling produced by air in the cellular substance. The common cause is a fractured rib, by which the vessels of the lungs are wounded, so that the air escapes from them into the cavity of the thorax. But as the rib is the nucleus of its being irritated, it is pushed the ribs and towards the pleura, which form the ribs and intercostal spaces, part of the air then necessarily passes through the pleura and the inserted muscles into the cellular membrane of the outside of the chest, and thence is diffused through the same membrane over the whole body, so as to irritate a considerable extraordinary degree. This affection of the cellular membrane has been commonly looked upon as the most dangerous part of the disease; but many circumstances will appear in the sequel.—(*See* *Emphysema*, *Med. Obs. and Inquiries*, vol. 2.)

Emphysema is most frequent after a fractured rib, because there is a wide laceration of the lungs, and so can let the air; it is less frequent in large wounds with a knife or sword, because the air has to pass and unimpeded issue; it is again more frequent in deep wounds with knives or small swords; but it is as common in many frequent in gun-shot wounds as the late Mr. John Bell supposed. (*On Wounds of the Chest*, p. 25, ed. 3, and, in fact, is not really so common as there are in cases of state, particularly where the ribs are not splintered.)

Emphysema has also been known to arise from a rupture of the larynx and trachea, produced by a blow or kick, as we find recorded in the case reported by Dr. S. Hoffman.—(*See* *Edin. Med. and Surg. Journ.* No. 72.)

The symptoms attending emphysema are generally of the following kind. The patient at first complains of a considerable tightness of the chest, with pain, chiefly in the situation of the injury, and great difficulty of breathing. The obstruction of respiration gradually increases, and becomes more and more insupportable. The patient soon finds himself unable to lie down in bed, and cannot breathe, unless when his body is in an upright posture, or he is sitting a little inclined forward. The countenance becomes red and swollen. The pulse, at first weak and contracted, becomes afterwards irregular. The extremities grow cold, and, if the patient continue undressed, he soon dies, in every degree of prostration exhausted.

The emphysema swelling, whenever seated, is easily distinguished from anæmia or anæmia, by the respiration which occurs on pressing it, at a time when the chest takes place on compressing a dry bladder half filled with air.

The tumor is extensive and free from pain. It does not of itself demand this depending parts, though it prevents it may be made to change its nature. The elastic, that is to say, it may be pressed down, but it rises up again as soon as the pressure is discontinued. The swelling never retains the appearance of the skin or the finger, or, in the language of surgery, never pits. The part affected is not heavy. The tumor has caused its appearance in one particular place; but it soon extends over the whole body, and causes an extraordinary distention of the skin.—(*See* *Edin. Med. and Surg. Journ.* No. 72, p. 431.)

The vessels of the pleura and intercostal may sometimes be so small to suffer the air to get readily into the cellular membrane, and irritate it, but may confine a part of it in the cavity of the thorax, so as to compress the lungs, prevent their expansion, and cause the same symptoms of tightness of the chest, quick breathing,

and sense of suffocation, which never does in the hydropneumothorax or empyema.—*Hewson*?

To understand why the air passes in all sort of directions, we must refer to the manner in which inspiration and expiration are naturally effected. In a well known, that is the perfect state, the struggle of the lungs always but in close contact with the pleurae, taking the chest, both in inspiration and expiration. The lungs themselves are only passive organs, and are quite incapable by any action of their own of expanding and contracting, so as to increase their external surface always in contact with the inside of the thorax, which is continually undergoing an alternate change of dimensions. Every particle that has any share in enlarging and diminishing the capacity of the chest, must contribute in the effect of adapting the volume of the lungs to the cavity in which they are contained, so long as there is no communication between the cavity of the pleura and the external air. If inspiration the thorax is enlarged in every direction, the lungs are expanded in the same way, and the air entering through the trachea, and the air vessels of these organs, prevents the occurrence of a vacuum.

But in cases of wounds, what there is a free communication between the atmosphere and inside of the chest, so sooner as the cavity expanded, than the air naturally enters it at the same time, and in the same manner, thus the air enters the lungs through the trachea, and the lungs itself remains proportionally collapsed. When the thorax is not contained in expansion the air is compressed out of the lungs, and also out of the bag of the pleura through the external wound, if there be a direct one; in which circumstance the emphysematous swelling is here effected.

But in the case of a fractured rib, attended with a wound in the pleura costalis, pleura pulmonalis, and *diaphragm* of the lungs, there is no direct communication between the cavity of the chest and the external air; in other words, there is no outward wound in the parietes of the thorax. There is, however, a permanent opening formed between the cavities of the lungs and the cavity of the chest, and two openings are between the latter space and the general cellular substance of the body, through the breach in the pleura costalis. The consequence is, that when the chest is expanded in inspiration, air rushes from the wound on the surface of the lungs, and enters itself between them and the parietal pleura. The lungs collapse in proportion, and the space which they naturally occupied when expanded, is now occupied by the air. When in expiration the dimensions of the chest are every where diminished, the air now lodged in the bag of the pleura cannot get back into the aperture in the collapsed lung, because there is already full of air, and is equally compressed every side, by that which is confined in the thorax. Were there no breach in the pleura costalis, this air could not now become diffused; the moment of inspiration would not enlarge the chest, remove the pressure from the surface of the wounded lung, cause air to be sucked out of it, as it were, and the space between the pleura costalis and pleura pulmonalis, and the process would go on till the lungs of the wounded side were completely collapsed. But in the case of a fractured rib or fracture of the chest, there is also a breach in the pleura costalis, without any free vent upwards for the air which gets out of the lung into the cavity of the pleura, as soon as the expiratory process lowers the capacity of the chest, this air, not being able to pass back through the breach in the collapsed lung, is forced through the laceration or wound, in the pleura costalis into the external cellular substance.

It is through the communicating hole of this structure that the air becomes most copiously diffused over the whole body, in proportion as the expiratory process continues to take care to lower the capacity of the chest, and passing the air, as it were, through the wound in the pleura costalis, immediately after it has been driven out of the wound of the lung in inspiration.—*See John Hall, On Wounds of the Breast, and the diaphragm, the Emphysema, &c.*

To prove that the communication of air in the chest is the cause of the dangerous symptoms attending emphysema, *Hewson* adverts to the histories of some remarkably cases, published by *Latre, Mery, W. Hunter, and Chevreau*.—*See Mem. de l'Acad. Royale des Sciences, p. 1712; Med. Obs. and Reports, vol. V, and Pathological Inquiries.*

In *Latre's* case, the patient, who had been wounded in the side with a sword, could not breathe without making the most violent efforts, especially during the latter part of his disease; he died on the fifth day.

In *Mery's* instance, the fourth and fifth ribs were broken by a sword passing over the chest; the patient's respiration was with singular force the first, and became more and more difficult till he died, which was on the fourth day after the accident.

In *Dr. Hunter's* case, the patient had received a considerable laceration on his side by a fall from his horse. He had a difficulty of breathing, which increased in proportion to the skin became elevated, and tense; it was to himself as well as to his friends. His inspirations were slow and almost instantaneous, and ended with a rush in the throat, which was produced by the shutting of the glottis after the least resistance to entrance without any pause, then suddenly opening the glottis, forced out his breath with a sort of gush, and in a hurry, and then quickly inhaled again, so that his respiration seemed to be to keep his lungs always full; inspiration attended expiration as fast as possible. He said, his difficulty of breathing was owing to an immovable tightness across his breast, and the pit of the stomach; he had a little cough, which accompanied his pain, and he brought up blood and phlegm from his lungs. He was relieved by scarifications, and recovered.

In *Mr. Chevreau's* case, the chest had received a laceration in the chest. He had a constant cough, bringing up, after many ineffectual efforts, a bloody discharge, heavily tinged with blood; he seemed to be in the greatest agony, and constantly threatened with suffocation. His pulse was irregular, and sometimes scarcely to be felt, his face livid, and when he was sitting, which was only very and then, he complained of a pain in his head. On passing a bandage round his chest, with a proper compress to prevent the discharge of air into the cellular substance, and to confine the motion of the thorax, the patient stated that he soon felt better. A strong compress on the hand also afforded him in the same way. notwithstanding bleeding, repeated scarifications, and other means, the state of suffocation and difficulty of breathing increased. On the fourth day, the air no longer passed into the cellular membrane, when on a sudden, striking his head back, which, as it were, for the admission of more air than usual, his breathing became more difficult and interrupted, he turned wholly insensible, and soon afterwards died.

Latre, Mery, and Chevreau opened their patients after death.

Besides a wound of the lungs and fractured rib, *Latre* found a considerable quantity of blood in the cavity of the pleura, and was sensible of some fluid air escaping as his first meeting the intercostal and pleura. The wounded side was hard and black, and the other side of the same color when inflated.

In *Mery's* patient no blood was extravasated, nor was there any thing preventing, except the fractured rib, the wound of the pleura, and that of the lungs.

Chevreau found a fracture of the tenth and eleventh ribs, and a wound of the lungs. The lungs before the wound were livid, and more congested than usual; but every thing else was natural, no extravasation, no inflammation, no internal emphysema.

Hewson made several experiments on animals, tending to prove, that air in their chests produced great difficulty in breathing, such symptoms in cases of emphysema; and in one case which he examined after death, air was actually discharged on separating the thorax.

The object of *Mr. Hewson's* paper is to explain the nature of the air in the chest, for the purpose of giving vent to the air confined in the cavity, but as it does for the discharge of air in cases of emphysema, of water in those of hydrothorax.

In writing of the lungs, says this author, whether occasioned by trauma, *etc.* or other causes, when symptoms of tightness and suffocation occur on, so far should we be from drawing the emphysematous swelling of the cellular membrane, that we should rather consider it as a favorable symptom, showing that the air is not likely to be confined in the thorax; and so he should we be from compressing the wound to prevent the inflation or emphysema, that we should rather dilate it (if not large enough already) or perform the paracentesis thoracis. We may judge of the necessity of this operation from the history of the Emphysema,

such as the aggrivated breathing, &c. For when these are not considerable, and the air passes out of the chest with sufficient freedom, the operation is then unnecessary.

If the disease is on the right side, the best plan for performing the operation, says Mr. Hewson, will be on the free part of the chest, between the fifth and sixth ribs; for there the integuments are thin, and in the case of air so depending drains is required. But if the disease is on the left side, it will be more advisable to make the opening between the seventh and eighth or ninth and tenth ribs, in order that we may be sure of avoiding the pleuro-peritoneum. A large penetrating vessel is inconvenient on account of the air entering by the aperture in such a quantity as to prevent the expression of the blood; a small vessel will be sufficient, especially as an does not require a large one for its escape. Mr. Hewson recommends dissecting cautiously with a knife, in preference to the common and hazardous method of thrusting a trocar.

There is one error prevailing in Mr. Hewson's paper, for which he has been justly censured by Mr. John Bell, viz. the idea that it is possible and proper to make the collapsed lung expand by making an opening in the chest. Bramwell and R. Bell have both imbibed the same erroneous opinion, and proposed plans for exhausting the air and expanding the lung. It is very certain that it is impracticable to make the collapsed lung expand, until the vessels in it are closed, and this closure is greatly promoted by the spast state in which the collapsed lung remains; a state also the most favorable for the absorption of any blood that the pulmonary vessels.

The true object then of making an opening in the thorax, which has purposes of aeration and relief, is not to obtain an expansion of the lung on the affected side, nor to take the pressure of the air from it; but to remove the pressure caused on the opposite lung by the distention of the mediastinum, and at the same time to diminish the pressure of the air on the diaphragm. The lung on the affected side must continue collapsed, and it is most advantageous that it should do so. The opposite lung is that which by a free vent of itself carry on respiration, and it is known to be fully adequate to this function, provided the quantity of air on the other side of the chest does not produce too much pressure on the mediastinum and diaphragm.

Mr. John Bell occasionally has remarks on this subject with avoiding the following passage:

1st. When the cracking (rattle) begins to turn over a fractured rib, small punctures should be made with the point of a lancet, as in bleeding; and if the point be struck deep enough, the air will rush out readily. But as supposing the lung is not adherent to the inside of the chest, this act was in the thorax, before it came into the cellular substance, it is plain that the thorax is still full; and that the lung of that side is surely collapsed and loose, and must continue so. The purpose, therefore, of making these scarifications, and especially of making them so near the fractured part, is not to relieve the lungs, but merely to prevent the air spreading more widely beneath the skin.

2d. If the air should have spread to very remote parts of the body, as in the scrotum and down the thighs, it will be easier to make small punctures in those parts, to let out the air directly, than to press it along the whole body till it is brought up to the puncture made on the chest over the wounded part.

3d. If notwithstanding these punctures and pressing out the air in this way, you should find by the oppression that either air or blood is accumulating within the cavity of the thorax, so as to oppress and the wounded lung, which was of course collapsed and loose from the first, into the diaphragm, and through the diaphragm to affect also the lower lung; then, a free incision must be made through the skin and muscles, with small punctures should be successively made through the pleura, in order to let out the air or blood contained in the thorax. (John Bell, *op. cit.*, p. 238.)

In all these cases, however, and frequently repeated, ventilation is generally proper.

After a few days the wound in the collapsed lung is closed by the adhesive inflammation, which the air no longer present out of it into the cavity of the chest, and the water round it may therefore be used. What air is already there is gradually absorbed; and the lungs expanding in proportion, restore the original situation.

The application of a bandage round the chest is more than granted in cases of emphysema; and its utility when the ribs are broken has been lately spoken of by Mr. Abernethy.—"Pressure by bandage (says he) not only renders the air from diffusing itself through the cellular substance, but serves to prevent a free escape of air of the wounded ribs, and of course diminishes the swelling of the wound, which would be increased by the constant transudation of air. Its great application, therefore, will often prevent a very troublesome symptom, while, at the same time, by keeping the fractured bones from motion it greatly lessens the sufferings of the patient." (Abernethy's *Surgical Works*, vol. 2, p. 179.) When emphysema is complicated with a fractured rib, the latter injury is unquestionably a reason in favor of a bandage. But whether the pressure of the roller will be useful or harmful with respect to the emphysema itself, or the state of the lungs and respiration, may be questioned. As to its tendency to moist the diffusion of air in the common vulgar language, this circumstance does not appear to us important, because the air, thus diffused, such as it diffuses the patient, is nearly harmless, at least as long as the interlobular texture of the lungs remains unaltered; a danger also which we have, as far as I can judge, less any tendency to prevent. Nevertheless a bandage will have no much effect in hindering the diffusion of air in scarifications, with this important additional consideration, that punctures or small incisions, made over the broken ribs, prevent the swelling of the air by letting it escape, while a bandage can only do so by retarding or lessening its escape from the cavity of the pleura; which mode of operation is sometimes would dangerously interfere with the promotion of respiration by the lung of the wounded side. At the same time, however, that when the air entered under the injured side of the chest is not in this quantity as to oppress the normal lung, and a rib is broken, a bandage will generally afford great relief. Indeed, it is his justice to Mr. Abernethy to state, that he does not recommend the employment of a bandage in all cases of emphysema. "Patients (says he) will be always be able to wear a bandage when one lung is collapsed, particularly if any previous disease has existed in the other, as it equally contains the nature of the rib on both sides, and in every possible enlargement of the chest, and necessary for the due extension of the air into the lung which still contains its functions. Under those circumstances, if the emphysema continues (and its continuance must always depend that the wound in the lung is not closed), I should esteem it the best practice to make a small opening into the chest, so that the external air might have a free communication with that cavity; and then the injured lung must remain motionless till no wound is healed, and the mediastinum will, in every way of the thorax, preserve its natural situation." (Abernethy, *op. cit.*, p. 153.)

The utility of a free incision and scarification is well illustrated in a case recorded by Larrey. The emphysema arose from a wound of the lungs by a lance. The whole body was prodigiously swelled, the integuments so distended that the limbs were inflexible, the eyes bulged, and the lips so enlarged that nothing could be introduced into the mouth. The pulse and respiration were scarcely perceptible, and the veins filled and interrupted. The lance had entered obliquely under the lower angle of the scapula, and through the muscles and internal surface of the wound were not parallel, the surgeons had applied adhesive strips, and closed the external opening. Hence the air, as it escaped from the lungs, distended the cellular texture. Larrey immediately removed the dressing, and with a lancet made the incision in the pleura and skin parallel. Clipping-glasses were then applied over the wound, and quickly filled with air and blood. The lips of the wound were now brought together, and kept so with a suitable bandage. Clipping-glasses and catheters were applied to various parts of the body, and in other incisions were made with a scalpel. The patient recovered. (Ope. Mem. de Larrey, *Médecine*, t. 1.)

Emphysema has been known to arise from the bursting of a vesicle, and absorption of the vesicle of the lungs; but the air which escapes in this instance cannot find its way into the cavity of the thorax, because the inflammation which produces the disease and absorption of the vessels closes those which are able

mem, and produces an adhesion of the edges of the wound or ulcer to the inner surface of the chest, so as entirely to separate the two cavities. We are not acquainted with any instance of the symptoms imparted to the confinement of air in the chest arising from disorganization and laceration of the surface of the lungs; but Parry, Dr. Hunter, and the author of the article *Emphysema* in the *Encyclopædia Médecine*, p. 100, have seen cases in which emphysema was imparted from abscesses of the lungs, attended with adhesions to the pleura, and sometimes in the situation of weak adhesions. In these instances, the air having made its way through the pleura and intercostal vessels, the air escapes also through the same track, so as to pass into the cellular membrane on the outside of the chest.

A violent effort of respiration has sometimes produced a certain degree of emphysema, which first enables its appearance about the clavicles, and afterward spreads over the neck and adjacent parts. The efforts of labour have been known to occasion a similar symptom; but no bad consequences attended. (*Medical Communications*, vol. 1, p. 176; Blackden, in *Arch. Med. et Chirurg.*, vol. 3; and Wilson's *Disc. on Strang.* p. 163.)

Lewis has described an emphysema of the throat, which, on account of its cause and the information furnished by it to the practitioner, is highly important. It took place in a young girl, who had suffered from a burn affecting her whole body, and he considers it as a pathological symptom of such an accident, denoting the existence of which it is so essential not to extend any further. (*See Blackden*.) It made its appearance on both sides of the neck, above the clavicles, and came on suddenly on the third day after the accident. The inspection of the body proved that the lungs and mediastinum were also in an emphysematous state. The rupture of the air, confined by the burnt body, passed, says Lewis, in vain attempt to expire, and especially when the violent fits of coughing occurred, a strong propulsion of this fluid towards the surface of the lung into the vesicular substance of the vessels. Thence the air passed into the cellular texture which unites the surface of the lung to the pleura pulmonary; and by extravasations from cells by cells it caused a spongy swelling of the cellular substance between the two leaves of the mediastinum. The emphysema increasing, at length made its appearance above the clavicles. The translocation of the lung and surrounding parts, in consequence of air passing into their vesicular and cellular texture, is an evident cause of suffocation, and the swelling seems so trifling as effect on the compression of a foreign body at the trachea, that one can hardly fail to look it on as essential symptoms, though an author has made mention of it. (*Blackden* in *Arch. de Med.* t. 4, p. 46.) The emphysematous swelling, sometimes formed in the axilla in the relaxation of a dislocated shoulder (*see Dislocation*), was pointed out by Desault and Ricard on the same principle as the swelling case, viz. a rupture of one of the vessels by the patient's efforts to hold his breath during the relaxation of the body. Here fail the explanation of the cause may be true has been questioned (*see Arch. de Sciences*, vol. 1, p. 11); the fact, however, admits of no doubt, and is both curious and interesting.

The example lately recorded by Dr. Ireland in one of idiopathic emphysema following pneumonia, traces as strong a resemblance to the case here cited from M. Lewis, that I cannot refrain from expressing that it may have been one of the same nature. (*See Trans. of the Royal and General College of Physicians*, vol. 1, art. 3.)

An erysipelatous swelling of the head, neck, and chest has also been noticed in typhoid fever. Dr. Huxham relates an instance of this sort in a soldier of a Scotch regiment. (*Medical Observations and Inquiries*, vol. 2, art. 3.) Another example as a case of bilious fever is recorded in a periodical work. (*See London Med. Repository*, No. 73.) A case of spontaneous emphysema is likewise described by Dr. Huxham. (*See Trans. for the Improvement of Med. and Chir. Knowledge*, vol. 1, p. 30.)

A curious example of what has been called a spontaneous emphysema is recorded by Mr. Allen Jones. The patient was a strong, athletic man, who about six years previous to his application to the Royal Infirmary, had received a smart blow on the neck from

the head of a post. This injury was soon followed by the formation of a fistula, issuing from the place which had been hurt. The swelling increased very slowly during the five years immediately succeeding its commencement; but during the week it entered a very rapid addition to its bulk. At this time it measured nearly six inches in diameter, seemed to be confined by a firm and dense covering, and the internal parts had undergone fixation. From the first to the last the manner had been productive of very little pain.

Being, from the apparent fluctuation that the tumour was encased, it was removed at a consultation to penetrate the swelling, draw off its contents, and then pass a seton through it. My plunging a lancet into it only a very small quantity of blood, partly coagulated, and partly fluid, was discharged—a quantity so trifling that after the operation, the use of the tumour was not perceptibly postponed. A seton was passed through the swelling. At this time the man was in perfect health.

About ten days after the operation, the patient was seized with extremely violent rigors, followed by heat, thirst, pain in the back, excessive pain in the tumour, and oppressive anorexia.

An emetic was prescribed, but instead of producing vomiting it operated as a cathartic. To remove the rigors the seton was withdrawn. The pain in the tumour, however, and the painfulness of the tumour, continued to increase, and thirty hours subsequent to making the puncture, air began to issue from the neck of the seton, and afterward the cellular membrane of the neck, and of the outer parts of the body in succession, became distended with a gaseous fluid. In the course of a few hours after the commencement of the general emphysema the patient died.

Ten days before death, when the body was first from putrefaction, it was opened. The emphysema was further increased and distended, some dark, and some clear, and was formed of its vessels, when the system was distended the size of the head of an adult. Even the cavities of the heart, and the cavity of the blood-vessels, contained a considerable quantity of air. We could discover no direct communication between the tumour and the trachea or lungs, although each was carefully sought for. (*J. A. Burns on the Surgical Anatomy of the Head and Neck*, p. 66—53.)

From such cases we may infer, that the preceding writers, that from the mere rupture of a line of the bronchial tube, occasioned by irregular action of the lungs, or by other external cause, a spontaneous distension of air may take place in the cellular texture of the body. Both examples are dependent on the same cause as the emphysema from injury of the lungs; only the rupture of the bronchial tube in the former cases is more obvious.

A general emphysema is sometimes seen in cases of gangrene. Here, however, it is hardly necessary to observe, the air is the product of putrefaction, and the former has not the smallest connection with any injury, or disease of the air-vessels of the lungs.

That very extensive emphysema does occur during the putrefaction process, without fracture, or punctured wounds of the lung, is a fact familiar with every medical practitioner whose opportunities are considerable; and it is equally well known, that this kind of emphysema is not attended with any dangerous consequences. It sometimes arises from a rupture of one or more of the air-vessels by the efforts of the patient to hold his breath.

In the *Maryland Medical Recorder* for January, 1808, a case of spontaneous emphysema is reported by Dr. Vesley, occurring in a child of 4 years old, which proved fatal in a few days. It is so to be regretted that paroxysms and suffocations were not resorted to, to relieve being placed on opiates and spastics, which failed to produce any improvement in the situation of the disease. Dr. Jackson suggests that possibly the disease arose from an accidental opening of the bronchus and involving membrane of the lungs, by which the air escaped and thus formed its way throughout the body. (*See*.)

C. C. Poyson, *De Emphysemate*, *Actus, Rep. Chir.* 5, 567; *Bull.* 1733. H. A. Nieu, *De Mors Emphysematis*, *De Dignis*, ed. Wien, 1751. *Monro's Papers*, in *Med. Observations and Inquiries*, vol. 3. *Mém. de l'Acad. Royale des Sciences*, for 1712. Dr. Hunter, in *Med. Obs. and Inquiries*, vol. 2. *Carton*, in *Pathological*

would be necessary to open the thorax itself. Galea, however, imagined to measure the breadth, without making any such opening, and he expressed an opinion that he should be able to effect a cure. Not thinking the bones so extensively diseased as was apprehended, he pronounced the suppuration benign. After the removal of a portion of the bone, the chest was quite exposed (as is already by reason of the perforation having been destroyed by the previous disease). After the operation, the patient experienced a speedy recovery.

1. L. First case with an abscess in the anterior mediastinum. A consequence of a gunshot wound in the situation of the abscess. The cavity had been merely closed with some clothe's application; no dilatation, nor any particular evacuation of the wound had been made. The patient, after being in an apartment three weeks, and having his regiment again, was sent back in with irregular diarrhoea, and other febrile symptoms. Post opened the wound, and found the true abscess. As there was a difficulty of breathing, he suspected an abscess either in the diaphragm or below the diaphragm; and, accordingly, he proposed laying the bone bare and applying the trepan. The operation gave rest to some tedious cough; and as soon as the true part of the abscess was perforated, a quantity of pus was discharged. The patient was relieved, and ultimately recovered. (*Phil. Trans. for Med. Char. t. 1, p. 98*.)

Another instance, in which an abscess behind the sternum was cured by making a perforation in the bone opposite the lower part of the cavity in which the matter collected, is recorded by De la Mairiade—(*Ann. de Chir. et de Méd. t. 15, 167, 168*.)

When, in consequence of inflammation, an abscess forms deeply in the substance of the lungs, the pus more easily makes its way into the air-vessels, and tends towards the bronchæ, close towards the surface of the lungs. In this case the patient, upon opening the cavity, when the opening by which the abscess has burst internally is large, and the pus escapes from it in considerable quantity at a time, the patient is in some danger of being suffocated. However, if the opening be not immediately large, and the pus wound is difficult to get the pus out, a recovery may ensue. Abscesses in the substance of the diaphragm, and collection of matter in the liver may also be discharged by the pus being coughed up from the trachea, when the parts adjacent become connected with the lungs by adhesion, and the thickness of the liver are absorbed on its convex surface. When the collection of matter in the liver occupies any other situation, the abscess frequently makes its way into the veins, and the pus is discharged with the blood. Several cases of this kind are related by authors; but the most remarkable two in the *Medical Observator*, by De Haen makes mention of others, and Pambour, in his book on the frequency of the Abscess of the Liver, p. 24, relates sufficient instances of a similar nature.

I shall now proceed to the consideration of empyema merely so called. Sometimes it is a consequence of a penetrating wound of the chest; occasionally it proceeds from the bursting of one of those vessels; in a few examples it arises from the pneumoniae, in which abscesses of the liver burst (*Ann. de Méd. t. 2, p. 17*; *Mem. med. t. 2, art. 4*) but in the greater number of instances it originates from pleuritic inflammation, especially that of the empyema first.—(*Boyer, Traité de Méd. Chir. t. 1, p. 303*.) Empyema very rarely takes place in both sides of the chest, but is almost always limited to one side of the pleura.

According to Boerhaave, when empyema arises from pleuritic inflammation, pleuritis, or pneumonia, the symptoms characterizing it are always preceded by those of the disease, of which the effusion of pus upon the diaphragm is the effect. Dryness, thirst, therefore, increase whether the patient has pleurisy or pneumonia; the symptoms of which have lasted longer than a fortnight; and when, after a transient alleviation, there then flows constant diarrhoea, followed by a low, continued fever, with slight exacerbations. Notwithstanding these circumstances, Boerhaave holds, that the inflammatory disease has terminated in suppuration, and that the suppuration allowed the effusion of pus upon the diaphragm in the chest. Some of these arise from the mechanical action of the pus upon the lungs, heart, and portions of the chest, and being also in other effusions in the thorax, the rest may be

used to be the effects of inflammation and suppuration of the parts on the internal pleura, and therefore, particularly looking in empyema.

First, of the common symptoms, respiration is difficult, short, and frequent; the patient suffers great oppression, and experiences a sense of suffocation, and of weight upon the diaphragm. He cannot move about; even for a short time, without being quit of breath, and distressed with syncope. He has an almost incessant and very fatiguing cough, which is sometimes dry sometimes attended with expectoration.—(*Boyer, Traité de Méd. Chir. t. 1, p. 303*.)

No surgical writer with whom I am acquainted has treated with more discrimination, than Mr. Keen, Sharp of the symptoms produced by collections of matter in the chest. He remarks, that it has been almost universally taught, that when a fluid is extruded into the chest, the patient can only be, on the downward side, the weight of the accumulated fluid on the mediastinum producing trouble; and if he places himself on the upward side. For the same reason, when there is fluid in both cavities of the thorax, the patient finds it hard easy to lie on his back, or so turn forward, in order that the fluid may neither press upon the mediastinum nor the diaphragm. Now it is noticed by Mr. Keen, that however true the doctrine may prove in most instances, there are a few in which, notwithstanding the extrusion, the patient does not experience of more inconvenience in any posture than another, nor even of any great difficulty of breathing.—(*See De Bruns's Obs. III, and Monro's, &c.*)

In this account, observes Mr. Keen, it is sometimes less easy to determine when the operation is necessary, than if we had so exact a criterion as we are generally supposed to have. But, says he, though this may be wanting, there are some other circumstances which will generally guide us with a reasonable certainty. He states, that the most infallible symptom of a large quantity of fluid in one of the cavities of the chest, is a permanent expansion of that side of the chest where it does lie, in proportion as the fluid increases; and will necessarily elevate the ribs on that side, and prevent those ribs contracting so much in expiration as the ribs on the other side. This change is said to be most evident when the surgeon views the back of the chest.—(*Boyer, vol. vi, p. 357*.) Mr. Sharp also refers to De Bruns's Obs. III, vol. I, in order to prove that the pressure of the fluid on the lungs may sometimes be so great, as to make them collapse, and almost totally obstruct their function. When, therefore, says Mr. Keen, the thorax becomes thus expanded after a previous pulmonary disorder, and the case is attended with the symptoms of a suppuration, it is probably owing to a collection of matter. The patient, he observes, will also labour under a continual low fever, and a particular anxiety from the load of fluid.

Resolving the situation of the cavity by an accumulation of the fluid, the patient will be sensible of an induration, which is sometimes so evident, that a bystander can plainly hear it in certain motions of the body. Mr. Keen adds, that this was the case with a patient of his own, on whom he performed the operation; but the fluid in this instance, he says, was very thin, being a smooth matter rather than pus. Sometimes, when the practitioner applies his ear close to the patient's chest, when this is agitated a noise can be heard like that produced by shaking a small cask not quite full of water.—(*See Dr. Jenner's Case, on Fracture of the Pelvis, &c. of the King's and Queen's College of Physicians in Ireland, vol. 5, p. 6*.) In this instance the fluid resembled water.

According to the same author it will also frequently happen, that though the skin and superficial vessels are not inflamed, they will become enlarged in certain parts of the thorax; or, if they are not enlarged, they will be a little thickened; or, as Boerhaave, the intercostal spaces are enlarged, and when the suppuration is considerable, instead of being depressed, as they are in this person, they project beyond the level of the ribs.—(*Med. Chir. t. 2, p. 287*.) These symptoms, joined with the enlargement of the thorax, and the preceding collection of the pleura of lungs, were unquestionably in favour of the propriety of the operation. On observing Mr. Keen, among observations to recommend it upon such emergency, this is one, that if the operation should resemble the case, on account of the water which would neither be very painful nor dangerous.—(*See*

Critical Inquiry into the Present State of Surgery, vol. vi. Emphyema.

"This difficulty of lying on the side opposite to the collection of pus," says Le Den, "is always accompanied a sign of an emphyema. This sign, indeed, is in the affirmative; but the want of a dullness does not prove the negative; however, when there is adhesion of the lungs to the mediastinum, the patient may lie equally on both sides." (*Le Den's Obs.* p. 198, edit. 2.) The explanation of this circumstance offered by Le Den is, that when the cyst, in which the matter is contained, is between the mediastinum and the lungs, the mediastinum gradually yields to the volume of the pus in proportion as it is formed, and the cyst, in which it is contained, becomes dilated; "whence habitually becomes a second nature." Whereas, in an emphysematous person, in which the lung is not adherent to the mediastinum, and who lies on the side opposite to that in which the collection of pus is situated, the mediastinum is on a sudden loaded with an unusual weight of fluid—(P. 111.)

Internal contractions, that the difficulty of breathing which patients with emphysema find in the chest, sometimes lie lying upon the side opposite to that on which the disease is situated, never originates, as has been repeatedly taught and believed, from the fluid pressing upon the mediastinum and opposite lung—"I have (says Le Den) produced artificial cases of hydrothorax, by injecting water into the thorax of several dead subjects, through a trocar made in the side. This experiment can only be made on subjects in which the lungs are not adherent to the parietes of the chest; by this way from three to four pints of water were introduced. I then carefully opened the opposite side of the chest; the ribs and lungs were removed, the mediastinum could be distinctly seen, pushing from the vertebrae to the sternum, and supporting, without yielding, the weight of the fluid, in whatever position the body was placed."

It is evident, then, that patients with thoracic emphysema lie on the diseased side, in order not to obstruct the dilatation of the sound side of the respiratory organs, one part of which is already in a state of contraction. It is for the same reason, and in order not to increase the pain by the motion of the inflamed pleura, that pleuritic patients lie on the diseased side. The same thing is observable in peritonitis; it is a rule, in all affections of the parietes of the chest.—(*Richardson, Young, Obs.* L. 4, p. 168, 169, edit. 2.)

It appears to me, that there may be some truth in the foregoing statement; but the experiments are far from being conclusive with respect to the assertion, that in cases of emphysema, hydrothorax, &c. the fluid on one side of the chest does not compress the opposite lung. In the first place the quantity of fluid is frequently much larger than that which Richard and Rogers, secondly, although the mediastinum may not be so yielded to as the weight of a liquid suddenly injected into one side of the thorax, yet it may do so by the gradual effect of disease. Thirdly, many of the pleuritic cases of emphysema were adverse to Richard's inference.

Although surgeons should be aware, that patients with emphysema can sometimes lie in any position, without particular aggravation of the difficulty of breathing, yet it ought to be distinctly understood, that the generality of patients with this disease cannot place themselves on the side opposite to that in which the collection of pus is situated, without their respiration being very seriously obstructed. Another circumstance also which deserves to be mentioned while we are treating of the symptoms of emphysema is, that the adhesion of the intercostal membrane is sometimes not confined to the thorax; we can find it more remote parts, as the same side of the body as the collection of matter.—Both the foregoing remarks are confirmed by an interesting case which was published by Mr. Hey.

Sept. 2, 1780, Mr. Hey was desired to visit John Williams, who had been ill ten days of the influenza. The patient was found labouring under a fever, attended with rough difficulty of breathing, and pain in the left side of the thorax. He was bed-ridden; Hicines were repeatedly applied to the chest, and he took little or no nourishment, with a smooth mixture to stay his cough. "He was immediately relieved by three leeches, especially by the application of the blisters; but repeatedly relapsed." At last he began to die, and he expired

with the utmost difficulty, and could not lie on the right side without danger of immediate suffocation."

Mr. Hey found the patient in the state just now described on the 12th of September. "His face, and especially his eyes, were a little swollen on the left side." The left side of the thorax was larger than the right, and the intercostal spaces, they said, distended, pressing the intercostal muscles, they said, distended, they yielded a little to a strong pressure, but rebounded again. The abdomen, especially in its upper part, appeared to be fuller than in the natural state.—(*Mr. Hey's Practical Obs. on Surgery*, p. 476.) This last symptom is also particularly noticed by Boyer.—(*Med. Chir. L. 7, p. 237.*)

Another remarkable symptom which is occasionally produced by collections of matter in the chest, is an alteration in the position of the heart. I have seen a patient in St. Bartholomew's Hospital, who had a large quantity of matter in the left lobe of the lungs, that it completely displaced the heart, which pulsated against the inside of the chest at a considerable distance to the right of the sternum. This matter he might perhaps have been cured had paracentesis thoracica been performed in time. Some supposed an aneurism from the throbbing on the right of the sternum, and the case was not fully understood till after death, when the body was opened. A little matter in the synchysis, however, might have occasioned any kind of mistake, understanding, that it was an aneurism, and that making an opening for the discharge of the matter affecting the only natural chance of preserving life. There had been pain and inflammation in the chest, relieved by leeches; there was very great difficulty of breathing; the heart, which ordinarily lies in the usual place, was displaced; but now pressed on the right side of the sternum.

That the heart should be displaced in this manner by very large collections of fluid in the right cavity of the thorax, one would naturally expect; but it is a circumstance that has not been much noticed by writers. Lewis, however, has related a highly interesting case, where the heart was not only pushed considerably to the right of the sternum, but its action was so much impeded by the displacement of its position, that the pulse in the large arteries was thereby rendered extremely feeble. In this instance, also, the diaphragm had descended so low down as to compress some of the small intestines into the cavity of the peritoneum.—(*Memories of George Milne, L. 2, p. 46, 50.*) Pott has also recorded an example in which a collection of fluid in the left cavity of the chest displaced the heart, the pulsations of which were perceptible between the third and fourth ribs of the right side, near the sternum.—(*Clinique Obs.* L. 4, p. 78.) Thus Boyer speaks of one case in which the displacement of the heart was so extensive that ex pulsation was felt near the right axilla.—(*Threats of the Med. Chir. L. 7, p. 237.*) In the same work also Mr. Blandin is also a proposition exhibiting the displacement of the heart into the right side of the chest, by matter in the left pleura, the left lung being nearly obliterated.—(*Lectures, Compt. de med. Muséum Ann.* p. 26, nov. 1786.) The heart is sometimes thus displaced by collections of fluid in the chest, and its pulsation is distinguishable in the epigastrium.—(*Hodgson on the Diseases of Arteries and Veins*, p. 95.)

When the cavity of the pleura contains fluid, and the surgeon strikes the thorax repeatedly with the ends of his fingers, a dull sound is said to be produced, quite different from what would occur were the chest in its natural state. But, as Boyer remarks, the symptoms, in which so much importance has of late been attached, being common to effusions in the thorax and several other diseases, will not draw us beyond, unless combined with other signs of emphysema. Nor will any useful information be derived from the above particulars, except the practitioner has had a good deal of experience in them, and they are repeatedly contrasted with the pulse in different positions.—(*Med. Chir.* L. 7, p. 237.)

The symptoms of emphysema are frequently very equivocal, and the existence of the disease is generally somewhat doubtful. Paracentesis pleurica is a case where the lung was displaced, at the same time that the thorax contained a considerable quantity of pus. Although the patient had been ill for two weeks, he had

suffered no difficulty in breathing, and had had only a slight cough. He then met with a case of nearly the same kind. A patient who had been for three days afflicted with a considerable dyspnoea and an acute pain on the left side of the chest, got somewhat better. He felt an unusual difficulty of breathing on whichever side he lay. The only thing which he complained of, was the sense of a fluctuation in his thorax, and a little constriction of his respiration. When he was in a sitting posture. These symptoms did not seem sufficiently decided to justify the operation, and it was delayed. The pleuritic symptoms continued, with cold sweat, and the patient died on the eighth day. Five pints of pus were found collected in the chest. (See Le Den's *Observations on Surgery*, p. 105, 123, vol. 2.)

The symptoms thus particularly depending upon suppuration, that is to say, upon the disease and suppuration within the abscess, we nearly the same as those which accompany all large deep-seated abscesses. The liver attending the disease is inflamed, but does not entirely crum. On the contrary, it soon changes into hectic, attended with flappings of the cheeks, heat of the pulse of the hands, and exaltations every evening and after meals. In the night, the upper part of the body are covered with perspiration; the patient is tormented with insupportable thirst. As appetite quite fails; the debility becomes extreme; he is subject to frequent fainting fits; diarrhoea occurs; and the liver itself becomes over-heated, shrunken, and of the yellow tinge observable all over the body. At length the blood, excrement and the latter Hippocratic vomit out, frequently attended with dried paper and coffee-colored urine, and sometimes with small pieces

In the operations of steamship and many other publicans relating to this subject, are omitted of its another part of this History from *Precursors of the Thomas*, it will only be necessary for us here to select a few of works, which may be advantageously consulted for references on engraving. A. Valler, J. H. Moffet, Emery's, some of his publications explain various pictures drawn upon glass, including painting and colored pictures painted upon glass or upon enamel. Willmet, 1778.—(Halle, Rep. de Mém. 2, 603.) Gervais de Meunier, *Art de Engraver*, 4to. Paris, 1778. Nodding's Critical Inquiry into the Present State of Engraving, vol. vi. *Engraving*. Le Grand's Observations on Engraving, J. L. Petit, *Traité des Méthodes d'Engraver*, t. I, chap. 2. Des Places de la Motte. Warner's Quest on Engraving, chap. 6, edit. 1. Mousnier sur l'Observation du Triquet en Serrure, par M. de la Ferrière, in Mém. de l'Acad. Royal de Chirurgie, t. II, p. 395, edit. 12mo. L. O. Van Maline, *de Engravinge*, Traactaat, 1780. Schöner, *Médecine Opératoire*, t. 2, p. 347, etc., edit. 1. A. P. Flaubert, *de Engravinge*, Monty, 1774. Abrégée de l'Engravinge, Chap. Radicalle abrégée par l'Opération, &c. Nov. Paris, 1768. Colletti, *Système Chirurgique Moderne*, vol. 2, p. 302, edit. 12mo. J. J. J. Collignon's Observations, in *Actes de Chirurgie*, t. 3, p. 183, etc. Nov. Romm, 1800. Kistner, *Nouveau Chir.* t. 1, sur les Maladies de l'Appareil respiratoire. Lenoir, *Nouvelle Médecine Chir.* t. 2, p. 275, &c. May's Practical Obs. in Surgery, ed. 2. Lemaitre, *Portuguese Chir.* t. 1, p. 121, &c. Lavry, *Mémoires de Chirurgie*. Millard, t. 2, p. 332; t. 3, p. 358, &c. Pilliet, *Congrès Chir.* t. 2, p. 236, &c. J. Arneton, *Principles of Military Surgery*, p. 284, &c. ed. 2. Nov. Romm, 1800. Morel, *Traité des Mal. Chir.* t. 1, p. 334, etc. Nov. Paris, 1821.

A most peculiar case of emphysema occurred under the above observation, which was reported at length in the *Med. Record* for 1922. The patient had been treated by a number of physicians for asthma of the chest, from the circumstance of large quantities of gas passing off from the stomach and bowels at short intervals, and the pulmonary symptoms were attributed to the displacement of the diaphragm by the pressure of the enlarged lungs. On dissection, however, the case was found to be very grave, and so urgent for the purpose of this letter had taken place through the emphysema near the cardiac orifice of the stomach, whereby the stomach slipped itself into the anus, and the matter was thrown up from the stomach or passed on by the bowels.

I have now a patient in this city under medical treatment, who, I don't see, is suffering under any more

which sometimes, or rather often, its way into the stomach, probably by a similar force. Large quantities of gas are passing periodically from the bowels or are ejected from the stomach, which I now satisfied does not come from the liver, and I have no doubt this is the case with many cases treated as hepatic diseases.

Revue.

ENCANTHUS. (From *En*, and *anthos*, the stage of the eye.)

The similarity, at its commencement, to looking like a very large, but a small, red, and some times rather livid, eelworm, which grows from the cartilage, lacrymæ, and, at the same time, from the neighbouring semicircular fold of the conjunctiva. The lividness emanates from a considerable quantity; its ends extend beyond the cartilage, lacrymæ, and semicircular fold, to the neighbouring lining of skin on both eyelids. The patient experiences very different inconvenience from the origin, and interposition between the assumption of the eyelids, which it necessarily keeps asunder, on the eye, to the ends the

The parasite keeps up a chronic onslaught, impedes the action of the cystitis, and, in particular, prevents the complete closing of the ure. Besides, partly by compressing and partly by displacing the wall of the ureters laterally, it obstructs the free passage of the fluid into the ureter.

According to Suruga, the sclerite, as in *Aspeirosetis*, is coarsely granulated like a malley, or is of a rugose and fragrant structure. Afterward, when it has acquired a certain size, one part of it represents a granulated mass, while the rest appears like a smooth, whitish, or red-colored substance strewn with various yellow, sometimes appearing as far as the conjunctiva covering the side of the eye and to the nose, to where the cilia and sclerotic tube. In this undisturbed state, the conjunctiva constantly secretes the farinaceous lachrymation, the saliva vomitans, and the continuous lining of one or both eyelids. In addition to the roots, which in such circumstances connect the lachrymation with the caruncula lachrymalis, the semilunar fold, and the conjunctiva of the globe of the eye, the conjunctiva exists as appendage, or process, first elongation, along the inside of the upper or lower eyelid, in the direction of its edge. The middle or body of the conjunctiva divides near the cornea, as it were, like a crocodile's tail, to form two appendages or eyelashes, one of which extends along the inner surface of the upper eyelid by the margin of which it is covered, while the other shoots in a direction from the internal towards the external angle, along the inside of the lower eyelid, which also conceals it beneath its edge.

The body of the encaitheon, or that visible portion of the whole excystozoan which reaches from the cystic cuticular wall to the second transverse, and, usually, over the crenulations almost to the junction of the following with the second, sometimes forms a prominence as large as itself and is character. At other times it is of considerable size, but depressed, and, indeed, conical, as it were, at its center. Still, however, the body of the encystozoan possesses that prevalent appearance which prevailed in that whole era or both the zoogeographies on the inside of the cysts; it appears rather like a honey comb granulated substance.

On turning out the inside of the eyelids, these appendages or elongations of the cornea form a very marked prominence. When both eyelids are equally infected, and turned inside out, the appendages can usually be seen, as it were, a bag, the back of which lies on the globe of the eye.

Robinson's (1971) remarkable apertures a compressible integument. This character is caused by the dull, not broken, or (as Ross says) the thick redness of the cuticle, by an excessive hardness, and the limited space which occurs in it, and extend to the dorsal, the whole body, and the tongue, especially when the former has been slightly hooked. It is also caused by the porosity of the cuticle, to which, by the partial dilatation of its surface, which is a fatiguing operation, and is thin and exceedingly brittle, thereby. The disease is constantly attended with anæmia, and preceded by a venous plethora of the venæ.

The spinal and neighbouring bones, which are of a spongy texture, are said to participate very much in the disease, the latter of which also becoming evoked. — *Ann. Lett. et des Arts* August 1. 3. 1787, 3. 1. The same

of extensive early attacks of palliative treatment; no less, indeed, an effort be made to enlarge it entirely, together with the whole of what is contained in the orbit, and even then the eyes is salubrious.

These joints become in the treatment that the operation rarely proves successful, and admit that it is always followed by an incurable weakness, and a considerable extension of the lower eyelid—(Nec. cit. p. 180.) Fortunately, the truly cancerous encephalitis is uncommon; Mr. Guthrie has not seen it (*Operative Surgery of the Eye*, p. 177); and Mr. Turrell, who was a surgeon to the London Eye-hospital several years, never met with an instance of it—(*Synopsis of Diseases of the Eye*, p. 183.)

The benign encephalitis, however, which it may be, is always a deadly hydatid. Those instances which are small, compact, and granular, like a testicle, or of a fingered structure, which originate either from the caruncula lachrymalis, or the sclerotic part of the conjunctiva, or from both these parts together, and even in part from the lateral commissure of the eyelids, may be raised by means of a pair of forceps, and cut off from the whole of their origin, closely to their base, with the divided scissors with certain caution. In the performance of this operation, it is necessary to introduce a needle and thread through them, with care, as some are wont to do, for the purpose of raising it, and destroying more completely its origin and adherences. The same object is fulfilled by means of forceps, without introducing the patient with a puncture of this kind, and drawing a thread through the part in order to make a noose. However, in cutting out an encephalitis of this kind, care should be taken not to remove, together with that portion of the caruncula which originates from the caruncula lachrymalis, any more of this latter body than what is absolutely necessary for the precise eradication of the disease, in order that no irreparable weakness may be occasioned.

When the large encephalitis has been detached from all its roots, says Keegan, the eye must be washed several times with cold water, in order to cleanse it from the blood, and then it is to be covered with a piece of the linen, and a protective bandage. On the 2d, 3d, or 4th day, the inflammation arising from the operation usually ceases, and the suppuration from the wound is accompanied with the requisite appearance already described. The little vessels are then to be washed with a piece of linen, squeezed to a pulp like a crayon, and the vitreous collyrium, containing the residue of quack seeds, is to be injected into the affected eye several times a day. If these seeds should not bring about the wished-for, coagulating, but, on the contrary, the small vessels situated on the caruncula and internal commissure of the eyelids should become stationary and connect with great flesh, the caustic strychnine ought to be applied to them. The conjunctiva, however, should be avoided, as much as possible, especially if it is all removed. When the fungus granulations have been destroyed, the cure may be perfected by the collyrium already mentioned, or another by introducing three or four, between the eyelid and the internal angle of the eyelids, the powder of turp. and the Armenian bole. Before recommending powdered alkali, other signs of its cooperation with leech salve—(Encycl. Anat. Chir. Acad. 22.)

Excision is regularly applicable to the lachrymal sacculus, which is of considerable size, and bottom lies at its base, or which forms a prominence as large as a nut or almond, with two fleshy appendages extending along the inner surface of one or both eyelids. The application of a ligature is such an enormous weight to be required as a method of cure for the large lachrymal encephalitis never has a sufficiently narrow neck to admit of being tied. On the contrary, when the tumour is subcutaneous, its roots are usually joined to the caruncula lachrymalis, the sclerotic lid, and the conjunctiva covering the eyelid, adherent nearly as far as the corner. In this state also, the encephalitis has one or two fleshy appendages, which reach along the conjunctival lining of one or both eyelids. Hence, though the ligature were of service to a portion of the body of the encephalitis, yet if both the appendages would still remain to be excised. This would require not only high skill, but the knife. In this disease, there is no substance for the use of homocutaneous, in which the

adhesions for the ligature, which so much injury does; for many are removed of considerable substance, sometimes being removed, without the least material occurrence from loss of blood. To these, Keegan observes, he could add a good number of his eyes, so that no doubt can now be entertained as to this point.

Pellier relates a case, in which an encephalitis was followed by a dangerous leucorrhoea, though it had been cut out by an expert operator. He refers, however, into no detail concerning the nature of the complaint, nor the way in which the operation was performed; circumstances from which one might deduce the nature of this unusual accident. Indeed, the same author adds, "I have often performed this operation by such excision, and have never met with a similar phenomenon."—(*Revue d'Observ. sur les Maladies de l'OEIL*, part 2, vol. 118.)

When the encephalitis is large and extensive, with two extensive fleshy appendages, one on the inside of the upper eyelid, and the other on the outside of the lower, we are to proceed in the following manner. The patient being seated, an attempt is to turn out the inside of the upper eyelid, so as to make use of the appendage of the encephalitis project outwards. By means of a small bistoury, a deep incision is next to be made into the encephalitis, in the direction of the margin of the eyelid; and then having taken hold of and drawn it forwards with a pair of forceps, we are to separate it throughout its whole length, from the inside of the upper eyelid, proceeding from the external towards the internal angle of the eye, as far as the body or middle of the encephalitis. We are then to do the same in the lachrymal appendage on the inside of the lower eyelid.

Afterward the body of the encephalitis is to be divided, if possible, with a pair of forceps; but when the instrument will not answer the purpose, a fleshy body must be employed. This fleshy portion is not to be detached, partly with the bistoury, and partly with the curved scissors, from the sclerotic conjunctiva, on the globe of the eye, from the sclerotic lid, and from the caruncula lachrymalis; dividing the substance of the lid just above of less deeply, according to the depth and hardness of the large lachrymal encephalitis. There it is proper to state distinctly, that when we have to deal with an old large tumour of this nature, deeply rooted in the caruncula lachrymalis, it is not regularly in our power to procure a sufficient quantity of the substance of this part, to prevent the cure from dropping every the shock after the wound is healed.

The eye is to be repeatedly washed with cold water. The rest of the treatment consequent to the extirpation of a large encephalitis, is almost the same as what was explained in speaking of the small encephalitis. Belling, the eye very frequently in the lesion of mucous, and employing abstract, detergent collyria, as the best local means, with the utmost attention, according to expectation, has taken place on the surface of the eyelid. Then we may have recourse to gold and silver points and cautery. The mildest topical applications are generally the best, both in the first stage of suppuration, as well as afterward, particularly when, together with the encephalitis, we have removed a considerable part of the conjunctiva which covered the eyeball towards the nose, and was intimately connected with the body of the encephalitis.

Consult Keegan's *Medical History*, vol. 4, p. 12; Richter, *Anfangsgründe der Chirurgie*, Band 2, p. 473, 48, edit. 1802; G. J. Beer, *Lehrb. von den Augenkrankh.*, 2. u. 3. Abt., 1807, p. 187. B. Turrell, *A Synopsis of the Diseases of the Eye*, p. 182, 44. B. J. Guthrie, *Lectures on the Operation of Surgery of the Eye*, 2nd. Lond. 1822, p. 107, 60.

ENCERPHALOCÈLE. (From *Encephalon*, the brain, and *celle*, a tumour.) A hernia of the brain.—(See *Revue Anat. Chir.*)

ENCYSTED TUMOURS. See Tumours, Encysted.

ENEMA. The following are some of the most useful fluids employed in the practice of surgery.

Cathartic.

- B. Decoct. herbar. ʒss.
Solei marmite ʒj.—Mucos.
- B. Decoct. rosear. ʒj.
Olei olive ʒij.
Mucosae Solis ʒij.—Mucos.

ARTIFICIAL

5. *Menthastrum*, *apoc. distillat.* s.d.g. 74. *Tinctura opii guttas xl.*—*Misc.*
 6. *Op. s.d.g. 107. Tinctura opii guttas xl.*—*Misc.*
 The two latter are particularly useful when phlegmatic exerts about the rectum, bladder, or uterus. They have great effect in dissolving spasmodic affections of the canal and the neck of the bladder.

Tubercle

Exposure in cases of unperforated hernia.
 6. *Nouveau* 1). *Ap. hernia* 3). The plug is to be introduced ten inches, and the ligure then removed for use. The ball should be first ejected, and one alternate the other, unless the glyster operate with dangerous violence, as it sometimes does in particular constitutions.

ENTEROCELE. (From *enteros*, the bowels, and *cele*, a tumour.) A hernia, the contents of which are intestine.

ENTERO-EPHLOCELE. (From *enteros*, the bowels, *ephloce*, the constrictor, and *cele*, a tumour.) A hernia, the contents of which are both intestine and omentum.

ENTEROTOMY. As Mr. Cooper has not introduced this operation into his Dictionary, it may be safely presumed that it has not been performed, at least with success, in Great Britain or on the continent.

Y^o Professor White, senior, of Berkeley Medical Institution, informs the honour of having first performed this operation, and with entire success, on May at the year 1850, for the extrusion of a loop from the intestine. This case, so novel and important, and standing as it does alone in this country as well as in Europe, will be found recorded in the *Med. Repert. of New-York*, *March* 5, vol. 4, p. 267.—*See*—

ENTEROPH. (From *enteros*, to turn.) An impression of the eyelids.—*See* *Protrusion*.

EPILOPHUS SHOT AWAY. The promise of General Larrey furnished a curious example, in which the epiglottis of a French soldier was shot off at the battle of Alcatraz, on the 23rd of March, 1811. The ball entered in the angle of the jaw, crossed the throat obliquely, and came out at the opposite side of the neck. The bone of the tongue was struck, and the epiglottis shot away; the patient spit it up after the accident, and showed it to the surgeon who first saw him.

The patient was not in much pain; but his voice was hoarse, feeble, and scarcely audible.

When he first attempted to swallow, he was seized with a convulsive suffocating cough, attended with vomiting. Annoyed by these, which the extreme heat of the weather, and the irritation of the wound excited, he incessantly repeated his attempts to drink, but always with the same result. Four days were passed in this deplorable condition. He already expressed violent complaints in his stomach, continued loss of sleep; he had a small scorched palate; and was beginning to lose flesh.

Such was the state of this wounded soldier, when Larrey saw him on the 18th day. After making a few inquiries about what had passed after the accident, attempting to make the patient drink, and examining the injury of the wound, Larrey was convinced that the possibility of suffocation and the inability to swallow, depended upon the parts being opening of the gullet, the lid of which had been shot away. The prognosis of the injury was accordingly favourable, and there can be no doubt, that if the patient had been abandoned to the resources of nature, he would have died in the course of a few days. The indications were equally difficult to fulfil. He went, spirit was to appease the hunger and thirst with which this poor soldier was afflicted. Larrey immediately was provided with up clean gun-time, constructed for the epiglottis. This instrument was introduced with the usual precautions into the pharynx, and by means of it the patient was given some drink, which relieved his thirst, and afterwards some rich food. The patient was led in the evening for six weeks, at the end of which time he was able, without the assistance of the tube, to swallow much purely, and thickened fluid made of pure milk. The powers of speech and deglutition at time became much more perfect; at intervals, as Larrey informs, of an enlargement of the external cartilage, and an expansion of that part of the tube of the instrument which lay next to the pharynx. Larrey found a series

valuable for the epiglottis.—(*Mémoires de Chirurgie Militaire*, t. 2, p. 145.—148.)

The foregoing case demands, in a convincing manner, the importance and utility of elastic gum tubes for obviating constriction and mediating down the impingement in wounds about the throat. All practitioners, and especially military surgeons, should be duly impressed with the necessity of having such instruments always at hand. The patient, whose case is above related, owed his preservation altogether to this means, without which he must have been starved to death.

In the 4th vol. of the above work, p. 217, is recorded another case, in which a gun-shot wound, that took away the epiglottis and broke the external cartilage, was successfully treated.

EPIPHORA. (From *epiphora*, to carry with force.) By this term is meant an accumulation of tears on the inner part of the eye; in consequence of which, the person affected is not only under the necessity of frequently wiping them away, but vision is injured by the morbid effusion, which they produce of the eye of light that over the eye. *Epiphora* is distinguished by modern writers from *epiphora*; the cause of *epiphora* lies in water obstructed in the absorption and conveyance of the tears from the lacrymal into the sea. *Epiphora*, on the other hand, consists in a superabundant secretion of tears, and is a disease of the secretion, not of the conveyance of the lacrymal organs.—(*See* W. H. Adams's *Medical Essay on the Diseases of the Lacrymal Organs*, p. 47, 48, *Loc. cit.* 1814; and *Beer, Lehre von den Augenkr.* t. 2.)

EPIPHORE. (From *epiphora*, the constrictor, and *phore*, a tumour.) A hernia, formed by a protrusion of the constrictor.—*See* *Hernia*.

EPHILIS. (From *ephilios*, and *phile*, the given.) A small tubercle on the gums. It is said sometimes to become cancerous. The best plan of cure is to cauterize it with a stick.

EPHILIS. (From *ephilios*, to irritate.) The state of irritation, attending the early stage of acute dysentery. Mr. Ferrius has described a state of the constitution produced by malarial action as it is a poison. He calls it the malarial miasm, and mentions that it is characterized by great depression of strength, anxiety about the precordia, irregular action of the heart, frequent sickness, trembling, a small quick, sometimes intermitting pulse, occasional vomiting, a pale, contracted countenance, a cold, if coldness; but the tongue is seldom firm, nor are the vital and natural functions much disturbed. In this state, as in the case of malarial fever, Mr. Ferrius advises, with a view of preventing the dangerous tendency of this affection, the immediate discontinuance of the use of mercury, and exposing the patient to a dry, cool air. The important criterion may often be ascertained by the cough, vomiting and large doses of ammonia, if necessary he also left off. *Epiphora* is also benefited, when the stomach will bear it.—(*Praxis en Luc. Viroto*, p. 156, &c. 1813.)

ERYSIPELAS. (From *erys*, to drive, and *ipe*, to swell.) St. Asclepius's erys, so called, from its tendency to drive the neighbouring parts into the same state, or, in other words, from its propensity to spread.

Erysipelas may be defined to be a catarrhus inflammation, attended with redness, which discolours, and leaves a white spot for a short time after being coated with the red of the finger, and the affection, which is irregularly circumscribed by a defined line, is characterized by a remarkable propensity to spread.

The part is generally of a bright red colour, clear, and shining. The disease is not accompanied by throbbing; and a burning heat and tingling are felt rather than acute pain. If the skin above be affected, there is hardly any perceptible swelling, and no tension; yet some difference is perceived between the sound and the inflamed part by passing the finger over it. In many instances, vesicles arise; a crustaceous which left Dr. Wilson to scratch the disease in the order of the finger. However, if we mean this arrangement to be referred to what is named local or accidental erysipelas, as well as to the idiopathic form of the disease, there cannot be a doubt of its immaturity; many examples of erysipelas from local erysipelas being characterized by a more or less immaturity.

However, the treatment of erysipelas has

Mr. Pearson divided the complaint into three forms, viz. phlegmonous, indurated, and gangrenous.—(*Principles of Surgery*, chap. 11.) In various authors, 1. The idiopathic, or primitive erysipelas, or that which arises spontaneously from an internal cause, is regarded by many other diseases. 2. Erysipelas, or secondary erysipelas, depending on another affection by which its progress is completely influenced. 3. Accidental erysipelas, or that which is usually excited by some external morbid cause.—(*Lancet*, Med. Press, &c., 2, Nov. 1848.)

The division adopted by Mr. Lawrence is into erythema, simple, indurated, and phlegmonous erysipelas. By erythema, he understands inflammation of the skin, either alone, or in conjunction with that of the subjacent adipose and cellular tissues. Like other inflammations (he says), it varies in degree. When it affects the surface of the skin, which is red, not sensibly swollen, soft, and without exudation, it is called erythema. Simple erysipelas is a more violent cutaneous inflammation, attended with effusion into the cellular substance, and generally with redness. Phlegmonous erysipelas is the highest degree of the affection, involving the cellular and adipose membrane, as well as the skin, and causing suppuration and destruction of the tissue.—(*The Med. Clin. Trans.*, vol. 11, p. 7.) When erysipelas, however, is defined to be inflammation of the skin, a peculiar kind of inflammation would be implied; for the skin, like all other parts, is often the seat of common inflammation. My view of the subject lead me to consider erysipelas as a compound of an inflammatory nature.

In the phlegmonous erysipelas, the skin is more raised than in the simple form of the complaint, the swelling is harder and deeper, and of a darker colour. The redness has often a brownish or dark lead tint; and the discoloration is important inasmuch, giving to the part a marbled appearance. The tumescence is more considerable than in simple erysipelas, the whole depth of the adipose and cellular contents being loaded with effusion, so that the part, or leg, appears of twice the natural size. The sensation of heat and pain, at first sight, is exaggerated to a very severe degree, and may be accompanied with throbbing. The affected part at first yields slightly to the pressure of the finger, but subsequently becomes tense and firm. Vesication, often minute and watery, rises on the surface with purple contents; but sloughing of the cellular membrane soon comes on, and the glands syphilitic are agitated. According to Mr. Lawrence's observations, pain, however, is not attended with increased swelling, elevation, and pointing, as in phlegmon; on the contrary, there is rather a diminution of tumour, a subsidence, and a loss of surface in the part. At first, the cellular texture contains a watery-like or wheal-like matter. The fluid gradually becomes yellow and purulent, and we often find it presenting all the characters of good pus, and very thick. The serum is diffused through the cells at an early period, and a mixture of serum and pus often fills a considerable portion of the cellular texture, without any distinct boundary. Frequently matter is deposited in small, separate pockets, forming a kind of little abscesses, which often run irregularly in the cellular texture. The substance turns grey, yellowish, or tawny; and sometimes appears like a dirty, spongy substance, filled with a turbid fluid, very heavy in viscosity, and when it is converted into more or less considerable fibrous streaks, of various size and figure, which some way soaked with matter like a sponge. The integuments over a large slough of this kind being deprived of their vascular supply, become cold, and often lose their quality. The suppuration and necrotic processes go on to a great extent when an entire limb is affected, sometimes completely denuding the skin, and often separating it through a large space, occasionally penetrating deeper, passing between the muscles, causing inflammation of them, separation between them, and often sloughing of the muscles. When the substance of a leg is thus generally inflamed, the pain is not escape; inflammation of the external membrane, effusion of matter into the skin, and elevation of the cutaneous membrane.—(*See Harrison's Practical Obs.*, p. 115, vol. 2; and *Lancet*, Med. Press, &c., 2, Nov. 1848.) An inflammation of such extent and violence cannot fail to produce the most serious derangement of the nervous system, typhoid symptoms, inflammation of

the lungs, or pleura, of the arterial system with haemorrhage, &c.; and the case is usually fatal. If, however, says Mr. Lawrence, the patient should recover after intense suppuration and discharge of slough, the parts which have been inflamed are so changed in structure, and the skin, fascia, muscles, tendons, and bones are so materially agitated and fixed after the extensive destruction of the connecting cellular texture, that the motion of the part is permanently and severely injured.—(*See Lawrence, in Med. Clin. Trans.*, vol. 11, p. 12.)

The following is Mr. Lawrence's description of simple erysipelas. The skin is precariously red and shining, having a light or rosy tinge in the early stage and slight elevation of the affection; when, in some languages, it has received the popular appellation of the rose; while, in other instances, it is of a bright scarlet, or even a deep and livid red. The cellular discharges are profuse, resembling at first the process is morbid. If the skin alone be affected, there is hardly any perceptible swelling, and no tension; but some difference is perceived between the inflamed and the unaffected part, by passing the finger over it. Erysipelas, however, is fixed by Mr. Lawrence to be confined to the skin, except in the slightest cases, effusion soon takes place into the cellular texture, causing a soft swelling; and this may be considerable, together with much tension and a sterner surface, when a large part of the body or an entire limb is involved. The inflamed part is hot and painful, at first a stinging or itching is felt, which soon becomes smarting, and burning sensation, with much pain is present. The pain is not so intense and burning as in phlegmon, nor is it attended with throbbing. This kind of inflammation often ends by resolution; the process and other symptoms disappearing, and the skin recovering its natural state, with or without a separation of the vessels. Frequently suppuration takes place from the inflamed surface, elevating the cellular tissue smaller or larger vesicles, or little bubble-like tumours produced by lentils, or rising to a boil, yellow, jelly-like deposits, which remain slightly adherent to both the cells and vessels. The contents of the vesicles or boils are transparent, sometimes being colourless, but more commonly yellowish; sometimes they consist of a thin pus, or they may exhibit a bloody or purulent discolouration. The fluid soon in thickness becoming thicker, opaque, and whitish or yellowish. The vesicle gives way; the fluid escapes, and is reabsorbed there, which soon falls off, leaving the skin smooth, or they may fall superficially necrotic. Erysipelas sometimes produces gangrene, but this is not a very lively rare occurrence. So long as this inflammation is confined to the skin, it does not produce suppuration; and the effusion of the cellular structure is so slight that termination in most cases is simple erysipelas. It may, however, become more severe in the part; and then we occasionally see the formation of abscess under the skin towards the centre or after the disappearance of the general erysipelas without. This inflammation generally marks a considerable surface of the skin, the inflamed part being irregularly circumscribed by a defined line. It spreads gradually to the neighbouring skin, declining and disappearing in the part first affected. Thus, we commonly see in various stages of erysipelas existing together in the same time in different parts of the skin. The part first affected is red and swollen; another part is elevated; while others exhibit induration and suppuration. Sometimes it leaves the part first affected, to appear at a distant situation. In origin, development, and complete termination within take place in one and the same spot. The neighbouring unaffected skin are frequently inflamed, and red streaks are sometimes seen leading to them.—(*See Lawrence, in Med. Clin. Trans.*, vol. 11.)

A time before the appearance of the return, and sometimes during several previous days, the patient experiences considerable indisposition, loss of appetite, his shiverings and violent pains in his limbs, accompanied sometimes with vomiting, and always with weakness and fever. Frequently these complaints occur, attended with a better state in the evening and first evacuation from the stomach. The tongue is moist, and covered with a yellow turgor. The pulse afterward has a dry, parched skin, constipation, an accelerated pulse, thirst, and other serious symptoms

of force. Blood drains from a vein which is a greater or less degree the inflammatory character. "Often, particularly when the head is the seat of erysipelas, the maxillary is principally affected, and erysipelas is of the kind called nervous, such as pain and oppression of the head, sometimes, some, or delirium. The tongue in such cases becomes dry and brown; but, according to Mr. Lawrence, this state of the organ is often owing principally to the contraction of the patient breathing merely through the mouth; the pulse is rapid and feeble, and there is great loss of sensibility strength; in short, the erysipelas is length and those called apoplectic. In other cases, the contraction and the nervous system are not much affected; but there is pain in the epigastrium region, and together with bad taste in the mouth, nausea, and vomiting; that is, ordinary indications of disordered stomach and intestinal canal, to which, as its cause, the local affection must be referred." (Med. Chr. Trans. vol. II, p. 8.) The last form of the complaint has been termed by French authors *erysipelas*.

The following is a description of phlegmonous erysipelas, as it sometimes appears when it attacks the head.

The attack is usually preceded by severe general complaints about the region of the head, and other symptoms very similar to those which indicate the approach of an inflammation fever. The heat is often accompanied with a little delirium, and almost always with depression of a more or less decided kind. The evening generally makes its appearance on the second night of third day of the fever, attacking the forehead, the cheeks, the nose, or eyelids. The swelling is slowly and smooth; but it is not distinctly circumscribed, and it gradually extends over each part of the face as described in the first article. The skin becomes of a bright red colour, and is usually having a tendency to a little heat, is often sometimes having a swelling of yellow. These colours disappear when pressure is made on the part affected, and very soon reappear when such pressure is discontinued. The patient experiences a burning heat and a disagreeable pricking in the part, rather than any acute pain; sometimes he complains of a very troublesome itching. The surface of the tongue is shining, red, and it is very, very irritable. But without tenderness, tension, or any sensation of throbbing. The effects are often so evident that the person cannot see, and the whole countenance is exceedingly disfigured. On more or less of the erysipelas, however, sometimes more about the forehead and face; they are filled with a transparent serum fluid, and thus a great resemblance to those which are attended by blisters. They commonly burst, or exude, on the fifth or sixth day, the fluid which is discharged sometimes extending the neighbouring parts. Frequently there is even a slight elevation at their base, which sometimes, in the worst sort of cases, assumes a purgative appearance, and falls rapidly into a state of complete suppuration. When the disease takes a more favourable course, the first heat becomes labile, the tension, dry, dry, and at the end of eight or twelve days the crabs, boils, and the scales formed in places which were occupied by the eruptions, fall off. The degree of danger depends mainly on the nature and other symptoms attending the affection of the face. When phlegmonous erysipelas attacks the face, the inflammation of the disease is dangerous, is very rare, (Lancet, vol. II, p. 117.) Mr. Lawrence represents phlegmonous as differing from simple erysipelas, in that the latter does not extend to the inflammation, which not only occupies the whole thickness of the skin, and extends to the cellular tissue, but even proceeds in the latter to suppuration and abscess. The skin and being often very much discoloured in the inflammation. Other writers, however, regard all examples of phlegmonous erysipelas cases which perhaps would be the consequence in the more view; and in fact, the exact line that should divide one form of erysipelas from another one, is always about being drawn. The affected part, which is at first firm, becomes softer, when diffused suppuration and tumor attend, with sloughs are under the skin. Experience proves that the seat of phlegmonous erysipelas is in the skin and cellular substance, and that the disease does not generally extend beyond the face. Mr. Lawrence differs from Mr. Hutchinson, in being always found the symptoms associated as

examined after death, and most no symptoms referable to any inflammation during life. "They may indeed become involved in the disease, when it is violent, and they may suffer partially when it extends to the intermuscular cellular texture, but they are not primarily affected in these cases, while in the majority of instances they do not suffer at all." (Lancet, Med. Chr. Trans. vol. II, p. 118.)

According to several writers, the seat of erysipelas is the greater number of cases is the very surface of the skin; its most violent and serious part—(Med. Chr. Trans. Med. L. 12, p. 225.) Perhaps it may be true, that the disease sometimes here, and is most intense; yet there can be no doubt that the affection generally extends more deeply, and affects the subcutaneous cellular membrane, particularly in cases of phlegmonous erysipelas. The remarks of Mr. Lawrence have taught him, as already noticed, that erysipelas is seldom confined to the skin, except in the slightest cases; often it takes place within cellular texture, extending a soft swelling; and this may be considerable, together with much tension and a burning surface, when a large part of the body or an entire limb is involved. (Med. Chr. Trans. vol. II, p. 118.) The affection of the cellular membrane, however, is very different from what happens in phlegmonous inflammation. In true erysipelas, healthy pus is rarely found enclosed in a circumscribed cavity; and when there is any secretion, in perfect manner, a foot is contained within the diseased part, almost like skin which a sponge would give. In such cases, the cellular substance is frequently torn.

It does not appear to me that any very exact information has yet been ascertained respecting the causes of erysipelas. We absolutely know nothing about the immediate cause; the prevailing theory concerning the predisposing causes are vague; and only those causes termed exciting appear entitled to much consideration.

Every surgeon is well aware, that possession of erysipelas is a disease of a low degree of a determined and peculiar nature, one feature of which is the inevitable production of this kind of inflammation upon the surface of the body.

With respect to the causes of erysipelas, it is the opinion of Mr. Lawrence that no difference prevails in this point between erysipelas and other inflammations. "The initial excitement of the vascular system is the long-continued disturbance of the stomach, alimentary canal, and liver, consequent on intemperance and excess, by the foundation of inflammation generally, and it depends on individual constitution, or on local causes, whether the skin or other parts shall be the seat of the disease. In most cases of erysipelas, the bowels and digestive system are more or less actively disordered, such disorder appearing sometimes to produce the cutaneous affection, sometimes to be excited sympathetically by it. Hence I should distinguish phlegmonous erysipelas, in which disease it may be observed, that the symptoms called bilious are commonly found also in phlegmonous cases." (Med. Chr. Trans. vol. II, p. 118.) Erysipelas may arise from external irritants of all kinds; from heat or cold; bites, scratches, ulcers, scabies, or other local causes applied to the skin; from wounds, abrasions, bruises, surgical operations, and all kinds of injury. The mechanical or chemical irritation of wounds, ulcers, or other local diseases will induce it. Neglect of previous preparations, moisture in diet, immoderate use of drinking, and other causes of the affected part, and in irregular degree of general action, are frequent causes of erysipelas after operations and wounds, and in the course of fevers and other local affections. When these several points are properly attended to, we shall not be much troubled with traumatic and local erysipelas. Irritating plasters, a heating food of dressings, and tight bandages, are common causes of erysipelas, whether in the case of wounds or operations. Light applications, and keeping the parts cool, are simple and efficient preventives. The most frequent causes, however, of this affection, after accidents or operations, is improper diet, that is, indigestion in simple food or fermented liquors. (Lancet, Med. Chr. Trans. vol. II, p. 118.) As far as I have seen, another very common source of erysipelas after wounds, is the taking of large quantities of wine.

According to Mr. Lawrence, simple erysipelas, and

the cases termed exanthematous, are mostly erysipelas, particularly from disorder of the portal vein or liver, and hence the epidemic fulvous and granular Erysipelatous erysipelas is most commonly produced by the wound of venesection, opening of the suppurative focus, as those of the paritis and obstetric, incised and lacerated wounds, and contused fractures; inflamed ulcers of the legs, and a fall due to persons who have large sores or ulcers rapidly healing; the wounds received in dissection, &c.

In most cases, erysipelas would seem to be primarily dependent on the state of the constitution. Thus, persons in the habit of drunkenness and other kinds of intemperance, and who in a state of intoxication meet with local excitation have erysipelas almost invariably in consequence of them. Other subjects, who lead more regular lives, experience, when they meet with similar causes, locally Erysipelatous inflammation.

The opinion of Hippocrates and Galen, with respect to the origin of this disorder from a corruption of the bile, is universally known to all informed in the profession of surgery. This old doctrine has been in some measure revived by Tissot and other writers in the last century, who attribute the cause of erysipelas to an acid humor, excessively alkaline one, diffused through the mass of the blood. But while I cannot dissent any evidence of the truth of this theory, observation obliges me to suppose, that the complaint seems frequently to be connected with disorder of the chylopoietic system, and especially of the liver.

A further proof that erysipelas is mostly dependent on constitutional causes, is, that the effusion is spontaneously frequent in autumn, or in any season, when the weather is succeeded by cold and wet.

Erysipelas attacks both sexes; but women are thought to be better, more subject to it than men, and the reason for this circumstance generally mentioned is, the greater delicacy and tenderness of the skin in females. But it would be quite as rational to expect those weaker and more amiable constitutions, and their secondary mode of life. In lying-in hospitals another character for the occurrence of erysipelas, near-born infants are often afflicted with a species of erysipelas, which begins in the umbilical region, and thence extends to the parietes. This case, which sometimes terminates in gangrene and places fatal, has been ascribed by some writers to injury done to the navel-string during labor, and by others to the bad air frequently allowed to accumulate in establishments of the above description, a cause which in other disorders, especially when it is first trivial, ultimately fails.

Sometimes the complaint is scarcely curable in one place when it makes its appearance in another, and when this tendency is evident in a great degree, the case is termed erysipelas scabularis, or erythrasma. La Moire has published a striking instance of this form of the disease. A child between nine and ten years of age was attacked with erysipelas of the scalp, forehead, and ears, which afterwards extended to the neck and then to the shoulders, "till his body and face became free from it; in proportion as the disease spread downwards, all the upper parts got well, so that in the end there were no signs of the infection of the body which had seemed, even down to the fingers and toes, the picture of all affections" (Med. Obs.).

A very uncommon variety of disease is a *generalized erysipelas*. No disorder is more subject than the present to relapses; but a remarkable case, sometimes attending the return of the complaint, is on hand sometimes strictly erysipelas. In different women, the erysipelated attack is occasionally such a story must not at the period when the disease should rise, cure. (Morgagni.) This particular nature of erysipelas has been observed in men: Larrey knew two men physicians, each of whom used to be attacked with erysipelas twice a year at the time of the epidemic; the other had only one attack annually, which was wont to happen in the beginning of the spring. My friend Mr. Mand, of Northampton, once labored with an erysipelas which was both venereal and venereal, affecting a body several times in the course of two years.

A difficulty has been started, that erysipelas is sometimes produced by contagion.—(Wells, in Trans. for the Improvement of Med. and Surg. Knowledge, vol. 2, art. 12, 1801. A. Knap, Sulla Gangrena Erysipelatosa, &c. Transac. p. 100, where Great Britain was Erysipelas

Contagiosa. See Thoms, 1825. Archib. in Med. Phys. Journ. vol. 17.) But, as Mr. Bateman has truly remarked, such cases are at all events extremely rare, and perhaps never happen in well-ventilated and cleanly houses.—(Sydenham, &c. p. 124.) As proofs of an epidemic description, the infection of many individuals in a single night is explained by the operation of the same exciting cause upon them all, without any suggestion of contagion. This part of the subject, however, is yet untraced. Mr. Lawrence believes that erysipelas of the face may be traced in some instances to contagion.—(See Med. Obs. Trans. vol. 36, p. 26.)

I think we must agree with Mr. Lawrence, that "a consideration of the signs, development and effects of erysipelas, whether local or general, leads us irresistibly to the conclusion that the nature of the infection is inflammatory. In its local leading characters it is redness, swelling, heat, and pain, and in its effects of effusion, suppuration, and sloughing, it agrees with what is called common or phlegmonous inflammation; while the general description proceeding and accompanying the local affection is often exactly alike in the two cases. Erysipelas, then, is nearly a suitable modification of cellulositis, or common and cellular inflammation. If we were to class these according to their general affections, we should place erysipelas between the exanthematous and phlegmonous. It is as difficult to class the former, not so circumscribed as the latter. The exanthematous are confined to the skin; erysipelas is some both skin and cellular structures; phlegmonous has its origin, even in the latter, the skin being so much involved.

The difference between erysipelas and phlegmonous, however, is not merely in the original and in degree of the disturbance: there is also a difference in kind. We may indeed say, generally, that phlegmonous is more violent and extensive than erysipelas, and sloughing of the cellular substance is more frequent in the latter than the former. The most striking and important distinction between the two affections is, that inflammation is confined to one spot in phlegmonous, and is strictly circumscribed in its seat, while it is diffused in erysipelas, and spreads without halt. This difference seems to depend on the different character of the inflammatory process in the former: the solidities called coagulable, coagulable, or seriginous lymph, which surround the inflamed part, forms a boundary between it and the sound tissue, which is opposite to the nature of erysipelas. In the latter, the effusion is serous; later, when matter is formed it is not confined to one spot, but becomes extensively diffused in the cellular tissue."—(Med. Obs. Trans. vol. 36, p. 17, &c.) These views correspond to those given by Mr. Hunter, whose original remarks on erysipelas are particularly valuable both in the pathological and the practical respects.

Like phlegmonous inflammation, erysipelas may be caused by any local irritation. Like other inflammations it may end in suppuration, though if a less perfect sort than that in which phlegmonous, the pus being rarely contained in a circumscribed cavity. The pulse, in phlegmonous erysipelas, is frequent, hard, sometimes full, and when the patients are thin, well blood has the same appearance, and is moved with the same kind of inflammatory action, as is taken away in other kinds of inflammations.

Mr. Lawrence says we agree with some medical authors, among whom may be placed Mr. Hunter, who regard erysipelas as a distinct species of inflammation, and capable of affecting various parts of the body as well as the skin. Some writers (the late) have referred to erysipelas certain inflammations of the conjunctiva, cornea, and lachrymæ; of the respiratory and alimentary trunks; of the various membranes in the head, chest, and viscera, and of the brain, spinal cord, and thoracic viscera. The distinguishing characters of erysipelas Mr. Lawrence refers to the possession of the exanthematous and cellular structures, in which it differs, and he therefore believes that such an affection cannot exist in parts so differently organized as solid membranes and the viscera. When the results of some of the viscera in question are carefully considered, it seems as if their structure were only that of erysipelas is connected with a particular state of nutrition, in which the inflammation, whensoever it is not would have a tendency to spread rapidly and extensively into the viscera, even thus and find its vent, positive further observations.

Treatment of Erysipelas.

Simple erysipelas, or extending a certain circumscribed area, yields to mild purgatives, and slight vegetable diet, with which moderate quantities of wine may be digested, and the saline mixture. Whether bleeding is right or not, in the treatment of erysipelas, is a point on which different sentiments prevail. The late, however, that venesection, in the earlier forms of the complaint, is now pretty generally allowed to be as unnecessary, as it is originally required in more severe eruptions. It is rather a prevalent notion, that it is unnecessary to remove blood in any case of erysipelas as frequently as in cases of other inflammatory diseases. We ought to be guided, however, in this respect, by the nature and extent of the inflammation, the state of the pulse, and other symptoms, never forgetting the patient's age, strength, and other important considerations. Another common belief is, that the patient will bear bleeding better in the evening, and in an open, pure air, than in a large city, and especially at an hospital. And it is remarked, that unless there be a considerable tendency to delirium or coma, blood-letting can seldom be repeated with advantage, at least in large towns.—(Pott's *Principles of Surgery*, 8th edition, *Symptoms*, p. 125, ed. 3.) Instead of this practice, the latter author recommends local bleeding and blistering, but not more or very near the diseased region, whereby he avoids protracting the inflammation, the frequency of which is better borne, after taking blood from erysipelasous parts, but Mr. R. Bell to procure a general condensation of the method, thought to observe, in relation to the above-mentioned form of bleeding patients freedom large, often, and it is an hypothesis which seems to be directing, greatly supported and justified, supposes having actually reported it as successful; and, as far as my observations extend, there is no business in waiting my opinion, that the abstract reasoning, whether a person living in town or country, should not likewise be the use of the blood, which might be rendered by otherwise important circumstances in the case. Alexander of Travers, and Parr, had a high opinion of the beneficial effects of plenty of fresh cool air in cases of erysipelas; but good air is generally beneficial in all diseases, and, perhaps, not more so in erysipelas than other disorders.

Mr. Lawrence supposes, that as erysipelas resembles other inflammations in its origin, symptoms, and effects, it should be treated on the same principles; that is, on the erysipelas plan. Venesection, local blood-letting, purging, and low diet are the first measures, to which saline and diaphoretic medicines may be afterwards added. He says, the latter three means are employed the latter vigorous treatment in the beginning seems to him most calculated to shorten the attack, and prevent the disease from spreading beyond its original seat. At the same time he states, that as the skin and cellular membrane are of secondary importance it is not so much necessary to arrest inflammation in them as in the vital organs; neither does the same reason for very active medicine exist as in affections of the eye, where a slight change of surface may seriously impair the utility of the optic medium; in our disorder and position; but the cellulars exhalation and nutrition, which erysipelas sometimes produces may render a hurt, in a great measure, irremediable, or may even destroy life. "The disposition of erysipelas is venereal; by resolution, therefore, reasons against meeting inflammation by active depletion. In many cases the disease passes through a certain course, and terminates favourably. It is sufficient to put the patient on low diet, to draw the alimentary canal, and then to use mild purgatives and diaphoretic. When it proceeds, as it often does, from an unhealthy condition of the alimentary canal, the removal of the internal disorder leads to the resolution of the local complaint. A cure, however, is observed, that resolution is sometimes effected both in curing the internal cause and in promoting the separation by resolution." Mr. Lawrence afterwards observes, that he does not mean to recommend that venesection equally serves, and in particular, that bleeding, whether general or local, are to be employed in all cases. In setting persons, in the robust, and those of full habit, in whom the pulse is full and strong, or where there is much heat and white tongue, in erysipelas of the head, attended with a moderate degree of affection of the sensorium, and especially in the very beginning of the affec-

tion, venesection will be proper; and it may be necessary to bleed largely, to repeat the venesection, or to follow venesection by some abstraction of blood. Under such circumstances, the other parts of the erysipelas plan must also be employed; that is, the alimentary canal should be cleared by an active purgative, which may be followed by saline and antiseptic, with the occasional use of mild opiates, and low diet should be insisted. As Mr. Lawrence adds, such can be made different from such a case, that that of an elderly person with a small and feeble pulse in the advanced stage of the disease. The interval between venesections is filled by numerous gradations, requiring corresponding modifications of treatment. The erysipelas plan itself embraces a wider range in part of degree, than blood-letting, local and general, with purging, salivation, the free use of salivary and antiseptic, and low diet, in the resolution of a mild erysipelas, with some saline medicine. Mr. Lawrence believes, that the treatment of erysipelas, like that of any other inflammation, should be modified according to the age, constitution, present health, and habits of the patient, and the period of the complaint. "In asserting generally that the erysipelas treatment is proper, I speak (said he) of the beginning of the disease, when the venereal and proper character of the affluence is apparent, and I am decidedly of opinion that, in some degree or degree, such treatment will always be beneficial in that stage. In many instances, active antiseptic measures are of the greatest service in lessening the severity both of the local and general symptoms. In others, the antiseptic use of alcohol with opium, and of diaphoretic with low diet, will be sufficient. When the affection passes in all well-distributed systems, the powers of life are soon seriously impaired, and all efforts must be directed rather towards supporting them, than combating the local affection, and have often been, with successful advantage under erysipelas of the face in its advanced stage, with repeated delirium, dry and brown tongue, prostration, short circumstances apparently desperate, by the free use of bark and wine." "The same writer does not local bleeding sufficient in the milder cases of erysipelas, and often necessary in the more severe ones, as an auxiliary measure. Purging, when practicable, he also deems as more efficacious than low diet, though objectionable on account of the painful state of the skin. Evacuation, he remarks, when applied to the external skin of some individuals, produces an effect analogous to erysipelas, but they exert no such influence over the internal skin, so much they may be applied freely and safely. In order to produce any decided benefit, he thinks that they should be applied in large quantities.

The authorities which may be cited in favour of the treatment of erysipelas by antiseptic principles, are Böhmer (1764), once Morison (1767), and A. C. 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 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2797, 2798, 2799, 2800, 2801, 2802, 2803, 2804, 2805, 2806, 2807, 2808, 2809, 2810, 2811, 2812, 2813, 2814, 2815, 2816, 2817, 2818, 2819, 2820, 2821, 2822, 2823, 2824, 2825, 2826, 2827, 2828, 2829, 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844, 2845, 2846, 2847, 2848, 2849, 2850, 2851, 2852, 2853, 2854, 2855, 2856, 2857, 2858, 2859, 2860, 2861, 2862, 2863, 2864, 2865, 2866, 2867, 2868, 2869, 2870, 2871, 2872, 2873, 2874, 2875, 2876, 2877, 2878, 2879, 2880, 2881, 2882, 2883, 2884, 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2908, 2909, 2910, 2911, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2931, 2932, 2933, 2934, 2935, 2936, 2937, 2938, 2939, 2940, 2941, 2942, 2943, 2944, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2952, 2953, 2954, 2955, 2956, 2957, 2958, 2959, 2960, 2961, 2962, 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3295, 3296, 3297, 3298, 3299, 3300, 3301, 3302, 3303, 3304, 3305, 3306, 3307, 3308, 3309, 3310, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332, 3333, 3334, 3335, 3336, 3337, 3338, 3339, 3340, 3341, 3342, 3343, 3344, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3353, 3354, 3355, 3356, 3357, 3358, 3359, 3360, 3361, 3362, 3363, 3364, 3365, 3366, 3367, 3368, 3369, 3370, 3371, 3372, 3373, 3374, 3375, 3376, 3377, 3378, 3379, 3380, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3391, 3392, 3393, 3394, 3395, 3396, 3397, 3398, 3399, 3400, 3401, 3402, 3403, 3404, 3405, 3406, 3407, 3408, 3409, 3410, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418, 3419, 3420, 3421, 3422, 3423, 3424, 3425, 3426, 3427, 3428, 3429, 3430, 3431, 3432, 3433, 3434, 3435, 3436, 3437, 3438, 3439, 3440, 3441, 3442, 3443, 3444, 3445, 3446, 3447, 3448, 3449, 3450, 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458, 3459, 3460, 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larger of manifestation is needed, sometimes often occur, which spread through the system and under the integuments is a surprising effect. "From the inside to the outside and over the glister manifest." In the first case which came under the eye of Mr. Hutchinson, this gentleman's plan of treatment, in addition to the usual medical means, consisted of first binding by means of suppurative issues, followed by incisions. Subsequently, however, he has adopted the method of making several free punctures with a scalpel on the inflamed surface in a longitudinal direction through the integuments, and then to the removal of the matter as far as possible, and before any suppuration has taken place. These incisions may be about an inch and a half in length, and in three or four places, and every six hours from the morning till evening, at the interval of twelve, which the disease is found to progress. Mr. Hutchinson states, that these incisions will yield between fifteen and twenty ounces of blood, and give relief to the patient, in the same time that they form channels for the escape of blood, and the presence of heat or matter. After the operation, dressings or external lotions are required.

By the pusillous kind of treatment, Mr. Hutchinson thinks the fatal termination of the disease may be rendered less frequent, and sometimes entirely wholly avoided. He supports this assertion by observing, that he has treated a case in the Royal Hospital for the last five years, during which the pusillous was followed.—(See *Med. Clin. Trans.*, vol. 2, p. 253, &c.)

Mr. Lawrence thinks the most powerful means of arresting the complaint is by making one or more long incisions through the inflamed skin with the subcutaneous and cellular texture, which are the seat of the disease. These incisions, he asserts, are followed very quickly and almost instantaneously by relief and cessation of the pain and tension; and the alleviation of the local suffering, he assumes to be accompanied by a corresponding interruption of the inflammation, whether it be in the stage of effusion, or in the more advanced period of suppuration and disorganization. Mr. Lawrence further asserts that this treatment is employed to the greatest advantage at the beginning, since it prevents the farther extension of inflammation and the commencement of suppuration and disorganization. At a more advanced stage the incisions bear the extent of suppuration and gangrene; and at a still later time they afford the readiest means for water and drainage, and facilitate the commencement and progress of suppuration and disorganization.—(*Med. Clin. Trans.*, vol. 11, p. 67, &c.) The great points in which a diversity of opinion exists respecting the treatment by incisions are the period when they are really necessary, and those manner and extent. Believing from various observations that phlegmonous erysipelas, when properly treated, does not tend to terminate in extensive gangrenous necrosis, and suppurative under the skin as Mr. Lawrence's account would make it appear, but, on the contrary, then it frequently abates of resolution, and often commences suppuration which may be safely opened at such a point as desired, I cannot acknowledge the wisdom or utility of making incisions for the prevention of crisis, the occurrence of which in all is quite a matter of uncertainty. Thus, though Mr. Lawrence has advised from several of the above, in relation to punctured early and free incisions, and these had the effect of preventing extensive suppuration and disorganization, the conclusion is certainly without satisfactory proof; and a case might have taken place with well without more. To the practice, therefore, in the early stage of the disease I should object as unnecessary. At a more advanced period, however, when matter is formed, I am decidedly an advocate for making a free opening for its discharge, but not for relieving pain, or making different wounds for the sake of any other purpose, nor for using the scalpel with equal caution to the use of the lancet, and sometimes of its edge to make with it a path requiring a foot or yard more for its introduction. Whoever looks into the reports of the treatment, as detailed in the *Lancet* and other works, cannot fail to be struck with the following facts. Several patients, treated in this way, have not been saved, and some have certainly gone out of the world in a very short time. Whether this arises from the shock of an excessive wound on the constitution, it is very difficult to state, or from profuse suppuration, or other causes, it is needless to enquire. In one or two instances, the cutaneous nerves are well

as large, and the arteries, more or less spared, and a partial paralysis ensued. Against the proposed treatment by numerous or long incisions I must therefore constantly protest: in the early stage the practice of incisions in any way is not only indicated for the reason above explained; and at a more advanced period if suppuration or gangrene commences, a prompt and free opening is undoubtedly required according to all the established principles of surgery, but not a number of pyramidal incisions. Dr. Wilson, of Greenock Hospital, makes use of kinds of erysipelas sometimes small pustules in the part, and repeats them in the morning and evening repeated twice a day; and often in high cases three or four times in the twenty-four hours. The quantity of fluid (as it is not blood alone, but blood and effused serum) which these punctures discharge, amounts sometimes considerably, he says, need never excite any alarm. With this practice he joins the application of the styptic solution, liquor potassæ, cast. and tincture of rhubarb. He also employs a lotion composed of hyssop, cast. and camphorated spirit, and water—(See *Med. Clin. Trans.*, vol. 11, p. 263). Of this method I still more observe that it has no effect to any let ever to cure a trial; but that, if I were the patient, I should rather select it, than to the bold sweeping incisions or numerous deep cuts which have been recommended by physicians whose opinions on other points in surgery I sincerely respect.

In this country, during the winter months, and especially in variable seasons, phlegmonous erysipelas as it is here called, is the most dangerous of local affections, as before, wounds, &c., and by speedy running and suppuration, this disease has often proved fatal, although the original disease was circumscribed and inconsiderable.

I have frequently known this kind of erysipelas to originate from a slight wound on the hand, and in a few days involve the whole arm in the suppurative process. And although the matter is torn severely penetrated the tissue, yet the matter would diffuse itself beneath the limit of the last, and require the most professional efficient remedies to prevent death by the pain and irritation occasioned by dissection.

Mr. Lawrence's plan of treatment has been intended with equal success under my own observation, the threatening symptoms subsiding immediately after long and free incisions were made through the skin and subjacent adipose and cellular texture. Professor Beinhart of this city has had opportunities of testing this practice to considerable extent, and he informs me that he has uniformly obtained the most satisfactory results.—(See.)

What is termed subcutaneous erysipelas is generally considered to be an acute case for incision and free evacuation, and almost always to require a liberal plan of treatment. In short, the field practice, in every case of erysipelas, is to let the resolution be regulated in a given measure by the state of the constitution, the stage, the strong or relaxed condition of the system, the sort of fever accompanying the disorder, the age, occupation of the patient, and the particular stage of the complaint. At first, though antiphlogistic treatment may be the only safe plan, circumstances afterward change so considerably that this must be abandoned, and a method quite the reverse of it vigorously adopted.

With regard to the treatment of gangrenous erysipelas, nothing more need be said than what is contained in the article on *Phlegmon*.

Collected Medical Papers of the Edinburgh Journal, vol. 2. Also, *Gazette Clin. de Douai*, par Richel, t. 2, p. 261, &c. *Encyclopédie Méthodique*, partie Clin. 3^e, Erysipèle. *Collier's First Lines of the Practice of Physic*, vol. 1. *Practical Treatise on Erysipelas*, &c. 1818. *Practical Principles of Surgery*, 1818. Some parts of *Baillie's Treatise on the Blood*, inflammation, &c. *Richmond, Nouveau Clin.* t. 1, p. 115. *Art. de* 2. *Lancet*, *Pathologie Clin.* t. 1, p. 8, &c. of 1818. *Traité des Maladies Clin.* par H. de la Roche, 1819, t. 2, p. 1, et 1819. *Wahle's on Cutaneous Diseases*. J. C. *Marshall*, in *Med. Clin. Trans.* vol. 5, p. 278, &c. and *Practical Clin. in Surgery*, of 2. T. *Baillie's, A Practical Synopsis of Cutaneous Diseases*, p. 125, &c. of 2. *Dict. des Sciences Méd.* vol. 12, p. 623, &c. *Köper, Traité des Mal. de la Peau*, t. 1. *Baillie's Aphorisms on Venereal Fevers*. *Edinburgh*, 1818. *De Dange's, in Brit. Med. Clin. Trans.* vol. 1. *Ames,*

promoting their discharge. In all these examples, the symbol is displaced from the central position, and there is at length accord. Instances, however, are not beyond where the sign has never lost, though the emphasis is transferred for a time. (*New Reader's Library*, Bibliobank, vol. 1, *Stage 2*, p. 242). White's *Case in Surgery*, p. 138.) In an instance later expected, the sign was not at all lowered, and the line remained its natural mobility. (*Lancet*, 1900, Year 20, 6, p. 212.)

Experience proves also, that after the induction, the motion of the eye and power of seeing may be preserved in cases where the eye has been gradually pushed out of the orbit, and been displaced a considerable time, even as long as several years, during all which period vision was lost.—(Annals. Medico-chir., in Med. Obs. and Inquiries, vol. 4, p. 371.) Langenbeck relates a very curious case of exophthalmos from a tumour in the orbit, whence, though vision was entirely prevented during the displacement, the position of the eyeball shape, and the iris capable of motion, after the extirpation of the tumour, the sightight became as good, that the patient could discern the smallest objects.—(New Med. &c. p. 241.) In order to reduce the eye into its natural position, it is necessary to remove the tumour by which an obstruction is occasioned. Suppuration and foreign tumours in the orbit must be treated according to directions laid down in the article Abscess. After the cure of such diseases, the tumour is often reduced to its natural dimensions, yet in this circumstance, the iris may become so rigid, that the eyeball will return into its again. Should this not happen, the calcification of the eyeball will be proper. The calcification and swelling of the orbital substance in the iris, may be sometimes dispersed by means of mercury.—(Diss. Sur plusieurs Maladies du Globe de l'œil, in Mé. de l'Acad. Royale de Chirurgie, t. 12, p. 126.) When such treatment fails, we are recommended to extirpate the eye.—(Abridg. Chirurgie, the Wundtort, t. 3, p. 412.) Tumours situated in the anterior part of the orbit may sometimes be removed. The most vascular tumours generally afford us the opportunity to remove them, and in this case, it is the actual cruetery to be used, in order to kill the protruded part of the tumour and make it calcify. In this country, most practitioners would prefer the employment of cutting instruments for removing such tumours. When, however, the tumour has grown in the orbit, it is almost impossible, and it should meet the effect of mercurial medicine and exposure, we are directed to extirpate the eye.—(Abridg. of Med. Hist. Abscess in the orbit ought to be opened, and after that has been done, the eye generally returns into its proper position.—(Folios.) When suppurated tumours in the orbit affect of being extirpated in the ordinary manner, the eye should be removed, but when this cannot be done, Hunter's advice may be followed, which is to open them, press out the condensed matter, and afterwards extract the eye. Considerable difficulty, however, frequently attends every effort to remove the whole eye, and unless this be done, a permanent cure cannot be expected.—(See Treatise of Surgery, p. 245. See Tumours, Encephal.)

The subject, the vicinity of the brain, and the communication between the parts within the *capitulum* and the *clavum*, the extinction of tremors from that artery is not exempt from risk of fatal consequences, as you have recently published by *Luttrell's*, 1855, p. 100. (N. 1855, 1, p. 201, 1854). A young lady was referred to Mr. Lawrence and myself, some time ago, by Mr. Mead, of Southampton, for advice respecting a tumour occupying the base and upper portion of the spine, and attended with a degree of exophthalmia, constant excretion at the point of the tumour, and occasionally bloody mucus. (See *Diagnosis*.) We answered from advising any immediate attempt at incision, the swelling being so firm and incompressible, that the disease was deemed to be purely of a bony nature. However, on seeing this case about a fortnight afterward, I was surprised to find the tumour not more than half its former size, and all the firm and (what was considered to be) bony substance below the capillary ridge of the *capitulum* gone, as well as the exophthalmia and excretion of mucus. Some vessels may irregularly, however, could not be seen, partly left, projecting in front of the *capitulum*, and partly

In a late publication, a remarkable case of exanthematous eruption is related by Mr. Travis (ital. gloss. of the text).

appears to have been gradually forced upwards and outward, and to have had its motion considerably impeded, at consequence of the other being partly occupied by two swellings, which were of the nature of the tumour; it was immovable. (See *Anatomist*.) The swellings could not have been removed, without it the same time enquiring the eye. Mr. Travers was, therefore, inclined to try whether applying a ligature to the carotid artery would have the effect of checking this source of the disease, as supposition which was warranted by analogous instances, in which the growth of swellings and their depression are brought about by diminishing the quantity of blood determined to them. The experiment happily succeeded; the swellings in the vicinity of the eye subsided; the patient was freed from several grievous complaints, to which she had been previously subject; and, among other benefits, a cure of the erysipelas was effected, which is most unusual in its present place. The case is most highly important on other accounts, and more particularly as confirming the fact, that the carotid artery may be tied without any dangerous effects on the brain, and as proving, that in cases of aneurism the garrot cannot be so afraid of producing it as it is supposed. (See *Med. Ann. Paris*, vol. 2, art. 1.) The judgment and decision with which Mr. Travers acted in this case, appear these highly meritorious.

The central artery was also tied by Mr. Dainton, stepwise at Dorvith, in a case very direct to the spring, and with equal success. — (For Med. Mag. Trans. vol. 8, p. 411 &c.)

Mr. Guthrie has seen an exophthalmos on each side, the result of an aneurysm of each ophthalmic artery, and also aneurysm in the orbit.—(*Operative Surgery* of the Eye, p. 158.)

When the causes of exophthalmos have been removed, the eye must be put into its natural position. If the organ has been displaced, the surgeon often finds the fulcrum of the indentation attended with difficulty, but he is frequently relieved by exposing mechanical appliances for the purpose of protecting the eyelid from the action of the eye. Yet, even if such cases, the eye must be then repaired; but if this should be judged impracticable, enucleation and bionia are to be tried. (See *Enucleation*.)

[illegible]

1830-1831. (From *Ex. trait, and ferrage*, a home & his country, by Robert Kerfoot, an enthusiastic growth of a busy center on the surface of a home, as a Boyer says, it is stirred by the mass of less considerable enlargement of a part of the whole of a home. - *Traite de Math. Chir.* 1. 2. p. 111.)

If bones resemble the soft parts of the body in their structure, they must resemble them in their function, and of course be lighter to various kinds of measure. Say, an extraordinary increase of the size and density of all the bones of an individual has been observed, which affords a clue probably also to be clamped with reference to which wetrooms usually apply the term osteitis.

The generality of writers, even the most modern, are afflicted with *dissonant beauty* expressions, which ought to be considered in a very cautious light; I would only venture the more so.

Up & down the mountains is like *free and fair*; the term being of a truly obscure connotation, the others being more or less hollow, empty expansions of the word, metaphors expressing a quality of *free*, *fair*, *down*, *up* within the shell of the domain. Persons, as mere thickings of the mountains, are also moved along the *free* mountains - (1911, *My Science*)

Med. J. 14, p. 214.) According to Sir Astley Cooper, exostoses have two different seats: by parietal exostoses, he means an osseous deposition joined between the external surface of the bone and the internal surface of the pericranium, and firmly adherent to both; by medullary exostoses, he signifies a cartilaginous formation, depending on the medullary membrane and encapsulated structure of the bone. The most frequent osseous tumors are other named exostoses of exostoses into the cartilaginous and bony, the first being "produced by the formation of cartilage, which forms the basis for the osseous deposits," while the second is a tumor softer than cartilage, yet firmer than ligament, in other parts of the body, containing vessels of bone, being of a medullary nature, level depending "upon a peculiar osseous condensation and union of vessels." It is a disease similar to "fibrous aneurism, but sometimes induced by the structure of the part in which it originates." (*Surgical Essays*, part 1, p. 155.) This last form of exostosis is probably the disease treated of in another part of this Dictionary under the title of Osteosarcoma.

Exostoses differ very much in regard to size. Those of the eye-balls are generally small and circumscribed, sometimes occur, however, for the left eye, that Sir Jervis House treated a very large tumor which had a bony base and was situated on the head.—(*A. Cooper, Surgical Essays*, part 1, p. 156.) The largest true exostosis met with was such as lay forward upon the long bones. In the history of surgery may be found numerous cases of *fibrous exostoses*, both in worthy of notice, that these were entirely all of them of the species termed *fibro*, and many of them were situated in the jaw, the clavicle, or the clavicles of the long bones. Observations of this kind are abundant in *Histologie de l'Homme*, de *Schweigger*, in *Ann. d'Hist. Nat.*, de *Blond*, the *Spécialité*, *Ammon*, the writings of *Morgagni*, &c.—(*Ann. des Sciences Méd.* 1, 11, p. 213.)

The bones most frequently affected with exostosis, are those of the cranium, the lower jaw, sternum, humerus, radius, ulna, bones of the carpus, and particularly the femur and tibia. There is, however, no bone of the body which may not become the seat of this disease. It is not uncommon to find all the bones of the cranium affected with exostosis, and the most perfectly unossified in their state.

According to Sir Astley Cooper, the exostosis which forms between the outer table of the skull and the pericranium, is of an extremely hard consistency, and generally situated with little pain, while the fibrous exostosis, springing from the diploe of the skull, is less firm and more vascular. It is described as being of a medullary nature, making its way through the inner table, and occasioning disease of the dura mater and final effects on the brain.—(*Surgical Essays*, part 1, p. 156.)

Sometimes, as Boyer remarks, the tumor is confined to a small part of the affected bone, occupying a mass proportional to its surface, and of various shapes, sometimes it rises insensibly, forming no very distinct base, and resembling a wart or low regular portion of a sphere. In some instances the figure is warty, and it projects in a greater or less degree. On other occasions, its base is rendered distinct by a pedicle or constriction, which varies in breadth and length in different cases. In particular instances, the exostosis, though limited to the surface of a bone, occupies the whole extent of it. Thus the whole external surface of the of the human skull has been found occupied by an exostosis, while the internal surface of the same bone was in the natural state. The warty exostosis of the frontal sinuses appeared an osseous mass, and the more late that immediately entirely ossified entirely ossified. These are the parietal exostoses of Sir Astley Cooper. In other examples, on the contrary, the two surfaces and the whole thickness of the bone are affected by an enlargement of bulk; and when this happens is a cylindrical bone, the medullary cavity is more or less reduced, or even totally obliterated. There are a few extremely uncommon cases, in which the exostosis of a bone acquires great solidity, and a hardness compared to that of ivory, without any natural increase of bulk. An exostosis rarely occupies the whole extent and thickness of a bone; but when this happens is a cylindrical bone, the external surface presents their lateral sides.

The structure and consistency of exostoses present great differences. Sometimes, especially when the tumor is not very large, and it is situated on the surface of a cylindrical bone, one may trace with the eye the diverging of the osseous fibres, in the interspaces of which we might say that there is deposited a new bony substance, the organization of which is less distinct. Sometimes the tumor is entirely cellular, and formed of a few blood vessels, intersecting sensitive spaces, which are filled with matter delivered from the vessels, and of various quality. This case of *fibrous* the *fibrous* exostosis. Exostosis on the enlarged portion of bone makes a sort of hollow sphere, with thick, hard walls, and the cavity of which is filled with fibrous granulations, even or less extensive and lobulated. According to Boyer, this variety of the tumor is distinguished from osteosarcoma, notwithstanding external appearances. The case here alluded to I conclude to be the same as that which Sir Astley Cooper has named the *cartilaginous exostosis* of the medullary membrane. "In this case the state of the bone is extremely expanded, or rather the original state is dissolved, and a new one deposited; and what the ossified variety thus produced, a very large mass of cartilage is formed, elastic, firm, and fibrous." It is not uncommon, but often ends in a very extensive disease.—(*Surgical Essays*, part 1, p. 172.)

In other instances, the tumor is perfectly solid, according to consistency that of the hardest bone, and equaling that of ivory. Here the surface is sometimes smooth, and like that of the bone on its natural state; sometimes irregular, full of little projections, and in some degree analagous. It is very uncommon to find a large portion of an exostosis converted into a gelatinous substance, but it is not at all uncommon to see the substance occupying part of the disease. Lastly, a very often happens that the other exostosis presents a combination of the bony substance, and of the white insensate substance, the portion of which are partially filled with a gelatinous matter, and partly with a sort of gelatinous substance.

When an exostosis is not very large, it hardly affects the surrounding soft parts; but when it has reached considerable progress, the muscles become stretched and enervated, the cellular substance is thickened, and is loosed, being adherent together, a kind of confinement produced among all the adjacent parts. Exostosis of considerable size may, however, seriously interrupt the functions of certain organs. The action of the four muscles of the leg has been known to be destroyed by an exostosis in the vicinity of the knee. A similar result arising from the exostosis of the pelvis need not be so large to impede considerably the functions of the pelvis, as experience has proved. An exostosis in the orbit has been known to displace the eye and to destroy vision. Lastly, exostoses, when situated near certain important organs, and of large size, may affect with different degrees of gravity the functions of these parts, as the lungs, the lungs, &c.—(See *Boyer, Traité de Méd. Chir.* 1, p. 541-544.)

Sir Astley Cooper has related a case in which the eyes were dislocated out of their sockets by two exostoses, which grew from the zygoma, and one of which destroyed the patient by making its way to the brain through the arterial process of the os pterion.—(*Surgical Essays*, part 1, p. 157.) In one instance, reported by the same author, an exostosis from the orbit or several *osseous* vessels obliterated the pulse at the wrist, by pressing upon the subclavian artery.—(p. 159.) In another *cartilaginous* exostosis of the medullary membrane of the *zygoma*, has extended so far back that it pressed the epiphysis down upon the ribs, glottis, and caused with difficulty of respiration, and so much trouble that the patient was destroyed.—(p. 172.)

External exostoses, or nodes, are observed in not chiefly on osseous bones, and such as these are especially covered with soft parts, so far as the bones of the cranium, and the front surface of the limb.

The causes of exostosis are not more to be ascertained. Most writers ascribe the disease to internal causes, such as scrophula and liver venereal. That the latter affection is the cause of scrophula, which is usually a species of exostosis, is not very clear, but that scrophula is ever concerned in producing any of the kind of exostosis must yet be admitted, at least when scrophula is ascribed in support of the doctrine. Boyer, however, and all the surgeons of the century

along the option that science is sometimes a cause of the disease.

Hydroids are occasionally found without exostomes, in which circumstance the former are supposed to be the cause of the enlargement of the base. A remarkable specimen of such a hydroid in the flora is mentioned by Mr. Ashey Cooper.—*Naturalist's Sketches*, part I., p. 169. He informs us it is a hydroid in the collection of St. John's Hospital, where the shell of the base is considerably enlarged, the processes over it thickened, and in the top of the elongated extremity, several hydroids, supposed to have built the shape of the enlargement of the exterior surface of the base, as well as of the increase in the cavity.—[*Ibid.* vol. i. p. 165.] A most interesting one of a solitary one on the Norfolk, containing hydroids, fine littoral leys published by Mr. R. Smith.—[*Phil. Mag. Trans.* vol. 18. p. 228.]

The case with which Henry entered Syria in some persons as a vigorous and enterprising man, and readers of a periodical that contemporary science has lately great influence. That such a man as is the possibility of persons would hardly exist here, with its others being on windings on the base which is struck. For Henry's vigor comes in a young friend of his, in which an epidemic which was undoubtedly caused by a fever, is growing on the metacarpal bones of the little finger.—*(See cut.)* Mr. Abernethy mentions in his lecture his having seen a boy from Cornwall, who was successively afflicted with an apparent predisposition to various, and an excellent disposition of body matter, that a very trifling blow would send a body struggling in any case of his body. His ligaments became was oxidized, and prevented the action of his neck; the muscles of his neck were also oxidized, so that he was, as it were, completely paralyzed. Besides all this, the subject is questioned his numerous other symptoms on various parts of his body. Mr. Abernethy gave, in this case, remarkable and acute acids, with a view of dissolving the liver, which it was removed, weight of 300 abundant in his system; but even if this fluid had been carried, and the same capacity of the chemical action involved, after passing into the principal, liver could then be expected to dissolve only the tubercular deposits of phosphate of lime, and at the same time leave the skeleton itself unaltered.

When an exhalation depends upon two systems, it is almost always preceded by an inspiratory, which in the respiratory system is merely the intake of the affected gases, but afterward becomes fixed in the part where the exhalation forms, and it is more severe in the alveoli. When an exhalation is caused by smooth, extra fibers, the patient chills, or rather it is quite tolerable. It is the same with the exhalation which succeeds a flow or constriction, without any marked external cause. In the latter stage the pain immediately excited by the accident subsides in a few days, and the swelling occurs so slowly, that no notice is taken of it until the effused serum is considerable. (Windsor, Med. Jour. 1. 3. 513.)

An individual commonly feels lonely, but its sense is various, and it may be subtle or painful. By themselves, and its first allusion to the bones, it may be always distinguished from other passages. Superficially, it is not to be mistaken for any other. Such was the case in which the patient bone was found, after death, to be three times thicker than natural. Such also was the condition of the bones of the Marquis at Dijon, in which a person had been an enormous on the several sides of the skeleton. The latter having prevented the discharge of the tumor and the introduction of a catheter by its pressure on the neck of the bladder.

the natural density of the boxes, and the little energy of their vital properties.

In the harshest aspect of economic reality, says Keynes, the increase is generated by the past, or, if necessary, it is very slight; the income grows slowly, and although it sometimes affords a considerable war, the increase is attended with no particular suffering, and no disturbance of the national economy. (Keynes, *op. cit.*, p. 2, p. 228.)

Our ignorance of the philology of exomorphs, particularly their status, accounts for the superfluity of our treatment of facts. With the exception of the verisimil exomorphs, or masks, there is no species of this affluence, for which it can be said that we have any one formula of efficacy.

Boyer and other workers on the diseases of the human nose in regard to nose capsules as a particularly dangerous cause of leprosy, and consequently the necessity to find out the absorption routes and possibly take away the parasites of the bacteria just as the swimming infection here and there does. Such agents, however, are well known that noses are capable of being disinfected, and this can only be effected by the action of the absorbent agent.

Boyer does acknowledge, indeed, that in 1841 such a structural contrast of the narrative, as well as a free oral, long sentences, culture, but he represents the event inaccurately here; and he advances it as a principle, that the resolution of questions themselves is a process, and that the greater part of the examples recorded in proof of its occurrence, were nothing more than periphrases. — (P. 267.)

When an organism is hurt, distressed, and free from pain and absorption of the structure of the time, it is a much more complete thing for it to issue in change, and reason stationary death life, without producing lavender, provided it be so situated as not to invade the functions of any vital organ.

But in the cellular structure of Beyer, which I take to be the same disease as the Japanese infection of the tubercular varieties of *San. Asch. Cookei*, the same and rapid progress of the disease indicates a deeper and more serious alteration of the texture of the tissue. A jury of the finest and most competent of pathologists in Philadelphia, and the best still, and with its own field, microscopical, though altered by the disease, now presents all several varieties, in which there is suppuration. At the same time, the external root parts, being successively and rapidly destroyed, rot, decay, and soon exposed a more or less extensive portion of the trachea, the disease of which has in many cases been very wrongly supposed to be cancer. It is, in fact, always fatal; that the part of the swelling caused by suppuration is not sometimes affected with cancer; but that it exists as a complication of the original disease, and as particularly by no means the result of the alteration of the root parts, and of the exposure of the diseased tissue to the contact of the air. When the surface is thus diseased, the growing contract to a certain point, and becomes limited. The suppuration is always of low quality, and is a quantity, notwithstanding the size of the cavity, of insignificant strength of the parent. The fever, which commences at an early period of the disease, assumes a sthenic type, and is, nevertheless, together with the exposure of the broken circulation, the irritation, &c., may bring on the patient's dissolution.

The following are the symptoms of what Sir Ashley Cooper characterizes the frequent victims of the regulatory industries. The disease begins with a general enlargement of the affected part of the body, indicating a considerable loss of weight of the economic self. This form of the complaint mostly issues in lung disease, though Sir Ashley Cooper has seen it in an individual fifty years old. "No treatment proceeds very gradually," and one must if one is careful prescribe adequate, although it produces some characteristic reaction in the lungs, it does not occasion recovery, the patient being dying at. When any cure does come, it is of an obscure kind, only being able to the extent of a few being confined to the patient. Thus an economic of the high-cost treatment values great agony by pressing on the economic drive. *Paleness, feebleness, and irritability* of the glands, are observed to attend the early stage of the disease; and afterward the complexion becomes red. In the mean time the diseased part of the body tends to carcinoma; but the patient takes no heed.

red colour. At many points the swelling feels hard, at others, it is so elastic as to create the presence of fluid to be ascertained; but if an opening be made, only blood is discharged. The surface of the tumour feels between tuberculated, and the prominent border, and their surface is often slightly indurated. The root is firm below, the apex is capitated, and the border is extremely irregular. At length the swelling abates; the skin becomes grey; but when the swelling itself is exposed, it discharges a bloody-coloured serum. A fungus then forms, which sometimes grows profusely, and after it has risen very high, sloughing occurs, and considerable portions of the swelling are thrown off. But although the swelling may be removed by this process, Sir A. Cooper has never known the disease cured by it; and in the end the patient is destroyed by the effects of the repeated bleeding, anæmic discharges, and constitutional irritation. Is the disease, as in common simple osteosarcoma, tumours of a vascular nature are often formed in other parts of the body, and affect the articulations of the affected bone frequently make their appearance in organs of the greatest importance to life. The swelling is described as originating from the medullary membrane, and as removing the vessels in the distance of three inches or more from the bone, so that they represent a thin layer spread over the surface. The blood vessels and large nerves are also similarly displaced. The tuberculated appearance of the skin, which is itself soot, is caused by projecting small nodules on the surface of the tumour. Under the pressure in the particular, pushed in a considerable distance from the bone. A part of the swelling itself is yellow, like fat; another portion resembles brain; and a third is composed of coagulated blood with numerous sized with serum. In some parts the white substance is found nearly as firm as cartilage; but in general it presents a spongy appearance; and is interspersed with speckled bone. The shell of the bone itself is in places absorbed; in some places it is only thinned thus, while at others it is extensively expanded, so as to form a case, like wire-work, over the tumour. The fungus granulations, proceeding from the medullary membrane itself, are exceedingly vascular, and often shoot from the cavity of the bone beyond the level of the integuments. (A. Cooper, *Surgical Essays*, part I, p. 105-106.)

According to Boyer, epiphyseal exostoses, with an internal cavity, and hyperæmia, are only attended with violent pain in the beginning, and when they have attained a considerable size they become almost indolent. But the excessive formation of the granulations, contained in their cavity, has the effect of producing an abscess, and rendering them so, so that such exostoses are exposed to fluctuation and dissection. This last effect may, indeed, be a consequence of the progress of the disease, and give rise to a series of consecutive abscesses, which may be compared with those which have been described in the preceding case. The epiphyseal exostosis, however, is less dangerous, perhaps, because the disease extends less deeply. Such tumours adapt of being directly excised; and operations for the destruction of the bone itself, and of the fungus growth which it excites, may be advantageously practised; an object which would certainly be useless and dangerous in the foregoing instance.

This formation of granules, not spoken of by writers, but which has been observed, especially in the hard and stitified exostosis, is that of tumours. The cavity of the description, after acquiring a large size, has been occupied with granulations, separated from the bone, which served them as a base, and have communicated with a reproduction in every respect similar to that which yields nature tumours, granules formed under any other circumstances. This formation is undoubtedly the most formidable of all, because nature proceeds as it finally without any violent disturbance; and unfortunately, it is the least common. Art can produce it, but by means are very different to those of nature. A most interesting case of an enormous exostosis of the upper maxillary bone, which followed the preceding course, was lately under my notice. (Boyer, *Treatise on Med. Chir.* 2, p. 547-550.)

The hardest exostosis, which falls from slowly, and without causing severe pain, is the least dangerous of all, especially when the constitution is sound, and the patient not of a bad habit. After the disease has as-

signed a certain size, it may become stationary, and continue in this state without intermission during life. This is most frequently observed in the very young. Without having precisely this extreme form, however, some exostoses which are firmly solid, and in which the natural organization of bone is still distinguishable, are capable of undergoing a slight reduction after the removal of their cause by surgery or art. Boyer states that two exostoses formed in a few scrofulous exostoses, and particularly in such as are venereal, and not of very large size.

The cellular exostosis of Boyer, the fungus exostosis of Sir A. Cooper, and the case which are named osteosarcoma, are the most serious of all, especially when the texture of the bone is considerably altered, and the disease is in a state of the disease. The rapid formation of the disease, the violent shock which it imposes on the constitution, and the heaviest characters which it carries, generally bring the patient too soon to the danger, and commonly leave no other means but that of amputating the limb.

The treatment of exostoses is to be considered in a medical and surgical point of view. When any general cause of the disease is known, as scrofula, or when it is to be removed by those means which experience has proved to be most efficacious. Thus bone tumours, venereal and antiscrofulous tumours, &c., according to the nature of the cause.

Whatever may be the species of tumour, with the nature of its cause, which, says Boyer, may be derived from the natural use of opium, which covers the disease is attended with severe pain. He mentions the use of the application of a liniment, or plaster, made with a decoction of the leaves of nightshade and bismuth, in which a strong solution of opium has been added. He thinks that an antiscrofulous plan, with bleeding is hardly ever necessary, because it weakens the point, the result is so tedious a disease, and can only be a palliative, incapable of curing or preventing the return of the disease.

When the disease is irregular, or it has been exposed, long or after any general method of treatment which may have been indicated, the surgeon may try various operations, particularly such as the medicinal process, in the use of a solution of iodine, the nature of exostosis, bathing in water containing a small quantity of alkali or potash, hydro-sulphurated waters, &c. Boyer's knowledge, however, that the progress of exostosis can scarcely ever be checked by any general medicinal treatment. The mercurial and iodine washes are less attended with any remedy which possess effect, excepting iodine and mercury, which has no doubt with ready success, except in cases of bone. It is an encouragement of any deep-seated disease in bone. However, Sir A. Cooper thinks that the best method for internal exostosis, is the destruction of granules in small doses, together with the compound powder of emparilla. (Surgical Essays, part I, p. 100.) Boyer is firmly of opinion that, with the exception of recent small exostoses, the nature of which is very doubtful, the removal of such tumours is almost impossible. A slight limitation of the swelling, and in favouring perfectly formed, are the best results which can be hoped for, whether they come spontaneously, or as the fruit of surgical treatment. (Boyer's Med. Chir. 2, p. 554-557.)

Whether any exostosis might be removed by surgery, says a writer, even those for a considerable time, is a point, perhaps, worthy of further investigation. It is certain that such operations tend to diminish their vitality after they have been removed, as much as they can be by mercury; and we also know that those kept open, produce the absorption of the dead bone in cases of necrosis. As the local treatment, Sir A. Cooper approves of the use both of iodine and iodine discharges from the latter have kept up with iodine parts of the necrotic and severe exostosis. (Surgical Essays, part I, p. 100.)

When exostoses merely covering a disfigurement, and do not interfere with the pressure which they produce on the neighbouring parts, it is certainly not advisable to undertake any operation for their removal, but, as Boyer has truly observed, in by far the greater number of instances, the local affection is attended less to be devoted than the means used for removing it.

Cancer, and the cavity have occasionally been applied to cancers, but they rarely do mischief. Beyer mentions an unfortunate woman, in whom some cancer was applied to as a vesicant at the middle of the 18th c., but which instead of removing the cancer, caused a tumour, of which she was not well two years afterwards. In a few instances, however, after the removal of fungus or cartilaginous excrescences of the interior of a horn with caustic substances, the application of the cautery has produced a reproduction of the diseased tissue, as we find exemplified in a case recorded by Sir Astley Cooper, where such a disease of the jaw was thus eradicated—(*Surgical Essays*, part 2, p. 158.) The local and external manner, also, in which the hyaline excrescence of the horn was attacked with the caustic, cauterized, and the actual cautery, by Sir R. Cooper, is particularly entitled to the attention of the surgical practitioner.—(*Med. Chir. Trans.*, vol. 1, p. 288, &c.) As far as my information extends, no attempt to stop the progress, or effect the cure of a fungus, positively, by firing the main artery of the horn, has ever yet succeeded. Two cases, proving the inefficiency of this practice are quoted by Sir A. Cooper.—(*Ibid.*, vol. 1, p. 158.)

As the fungous structure of the medullary substance is evidently possessed with a state of the visco-plastic atmosphere to what prevails in fungus haemorrhoides (see this word), the essential viscous of sanguiferous vessels never be too fully possessed, but as all medicines have any material power over the disease, and the operation is the only chance of relief, it ought to be avoided.

Cartilaginous excrescences of the medullary substance may sometimes be eradicated by removing their cause long covering, and then cutting away the cartilaginous matter closely down to the bony surface to which it is attached. Sometimes, as I have noticed, these excrescences are followed by the use of the actual cautery.

Perforated excrescences are also either cartilaginous or fungous, which latter are attended with less general swelling of the horn, and are more prevalent than fungous excrescences of the medullary substance. Violation, bleeding, sweating, and great discharges occur; and unless some operation be performed, the patient runs his life.—(*S. Cooper, Surgical Essays*, part 1, p. 158.)

The cartilaginous excrescences between the perichondria and bones, arises from inflammation of the perichondria and adjacent part of the bone; and a deposit of their cartilage adherent to both these surfaces takes place. In the substance bony matter is secreted, which is first thrown out from the original bone. As the cartilage increases in bulk, the quantity of phosphate of lime increases, and fresh cartilage is constantly deposited upon the outer surface of the ramus. On dissection;—1st, the perichondria is found thicker than natural; 2dly, immediately below the perichondria surface; and 3dly, osseous matter, deposited with sufficient, from the shell of the bone, nearly to the inner surface of the perichondria. When the growth of such a excrescent mass, and the disease is of long standing, the external surface consists of a shell of osseous matter, similar in that of the original bone, and communicating with its vessels, in consequence of the primitive shell having been the source.—(*S. Cooper, Surgical Essays*, part 1, p. 158.) The perforated cartilaginous excrescences infiltrate the ligament, very hard some of the disease. In their early stage they may sometimes be checked by small doses of mercury, the division of sanguiferous, and the excision of the cartilage with a hydragogue.—(*Ibid.*, vol. 1, p. 158.) When large or troublesome they may be cut away, as Sir A. Cooper states, without danger, if the disease be well circumscribed from the ligament extending.

When excrescences are produced of such size, and involve the ligament, and the external surface of the horn being entirely covered with the use of suitable virus, or even with that of a private and milder, the operation may be dangerous. Many instances of this kind, however, have been so very extensive and deep, that when situated on the horns, are painful become preferable, in any attempt made to cure or cut away the excrescence and preserve the member when they are situated.

In treating an excrescence, it may first be as freely exposed by the knife as commonness will allow, and to this part a small but not very to be applied. In cutting away some excrescences, the British law, described by Dr Jeffrey, of Glasgow (see *Amputation*), will be

found useful. Mr. Hey's name, and the semicircular incision, are now so well known to the profession, that I scarcely need recommend them to be practised in the present cases. Mr. Macleod, a surgeon in London, has invented a saw, well calculated for cutting above at a great depth, without injuring the tissues. It is a small, fine, perpendicular wheel-like saw, turned by means of a handle connected with machinery. It is highly recommended by Sir A. Cooper, who has given a drawing of it in his *Surgical Essays*, part 1. An excellent saw invented and used by Professor Green, of Berlin, likewise merits particular notice on account of its ingenuity.—(*See* C. G. R. Schmidt, *10 Jahre Beobachtung der Beob.* 1819.) I would likewise recommend to the notice of surgeons the ingenious machine now, constructed by Professor Hall, of Copenhagen, and of which a description and engraving may be found in the *Edinb. Med. and Surg. Journ.* No. 74. A strong pile of bone-splinters, and especially Mr. Lisieux's sponge, the edges of which are in the line with the handle, will also be useful.

E. Victoria, De Oculis tuberculis. *Thes. Med. Bull.*, *Phys. Chir.* t. 4, p. 263. P. H. Schlegel, *De Oculis tuberculis*. *Comment. Academ. Götting.* 1772. J. Cooper, *De Oculis tuberculis*. *Annot.* 1780. J. R. Faguet, *De Oculis tuberculis*. 1774. *Alphersley, in Trans.*, for the improvement of Med. and Chir. Knowledge, vol. 2, p. 309. Boer, *De Oculis tuberculis*. *Comment. Academ. Götting.* 1771, p. 125. Rostker, *in Med. de Edinb. de Chir.* t. 3. Murray, *De Oculis tuberculis*. p. 20. *Phil. Trans.* de Med. de Chir. t. 3. Morgagni, *De Sedibus*, lib. 10, cap. 16. Walmsley, *De Oculis tuberculis*. *Philos. Chir.* t. 4. R. Faguet, *in Med. Chir. Trans.*, vol. 10. Sir A. Cooper, *Surgical Essays*, part 1, lib. 1, *Chir.* t. 3. *Edinb. Med. and Surg. Journ.* 1774, p. 263. *Ann. Med. Chir.* 1774.

EXTRAVASATION. (Three entries, out of, and one, a vessel.) A term applied to sanguis in the passage of fluids out of their proper vessels or receptacles. Thus, when blood is effused on the surface, or in the texture of the brain, it is said that there is an extravasation.

When blood is poured from the vessels into the cavity of the pericranium, it is termed the abscess, or when the contents of any of the sinistries are effused in the same way, sanguis call this condition an extravasation. The issue is also said to be extravasated, when, in consequence of a wound, or of clanking, or otherwise, it makes its way into the cellular substance, or among the abdominal viscera. When the blood spreads among the cavities of the brain in vessels of the gelatinous, this is a species of extravasation.

In wounds of the thorax an extravasation of blood also frequently happens in the cavity of the pleura. Large quantities of blood are often extravasated in consequence of wounds being ruptured by violent blows in the stomach, on the shoulder, and under the scalp this effect is observed with particular frequency.

In the various *Head, Spine, and Wounds*, I have treated of extravasations of blood in the cranium, chest, and abdomen.

EYE, CALCULUS IN THE INTERIOR OF. Scarcely known as an eye which was almost entirely transversed and a sharp calcareous. It was taken from the body of an old woman, and was not above half as large as the second one. The vessels appeared fleshy, and behind it was the use of a singular shape, convex, and without any point in its centre. The rest of its eyelid, from the limits of the cornea forward, was unusually thick by the touch. The particulars of the structure of this case will be read with interest, in *Surgery's Treatise on the Diseases of the Eye*.

Before this with a similar case.—(*See* the *Philos. Journ.* *Med.* vol. 13.) Polypus, *Hist.*, *Lancet*, *Morgagni*, *Moreau*, *Vin*, and *Peller* make particular mention of growth in the interior of the eye. Descriptions of the species of the form, of that of the cornea, however, and of what was supposed to be the eyelid, are noticed by Mr. Warton.—(*Medical Anatomy of the Human Eye*, vol. 2, p. 125, *Ann.* 1814.)

EYE, CANCER AND ECTROPION &c. Use of the well-known characters of cancers in general is in black persons advanced in age, rather than children

and young subjects. Hence, an observation made by the experienced Deane, that cancer of the eye is most frequent in children, could not but appear a position inconsistent with the usual nature of the disease in general. Yet here that statement is to be corrected while it was confirmed by the testimony of his own friend, who says, that more than one-third of the patients on whom Deane operated in the hospital for cancer of the eye were under twelve years of age! Here truth and accuracy as to many other questions relative to disease would never have been attained without the aid of medical analogy, whereby distinctions which bear a superficial resemblance to each other, while they are in reality of a totally different nature, are prevented from being confounded together. Now, when Scarpa even goes further than Deane, and asserts, that in many four individuals affected with what is called carcinoma of the eye, five of these at least on children under twelve years of age, this declaration, supported with the acknowledged propensity of cancer on all other organs to attack old rather than young subjects, might have remained a hypothesis merely in the history of cancer, had not the valuable investigations of Mr. Wardrop, beyond all doubt, that the afflicting disease which rendered it necessary for so many young subjects to undergo a severe operation, was not true cancer, but what is now designated by modern surgeons, fungus keratoides. (See on Fungus Keratoides, p. 209, Edin. 1839.) As Scarpa observes, the author has afforded a solution of the question, by showing from careful observation, founded on pathological anatomy, that the morbid change of structure in the eyelid of a child, commonly called carcinoma, is not in reality produced by cancer, but by another species of malignant fungus, to which the epithet keratoides is applied; a fungus, indeed, equally, and, with regard to the eye, more formidable and fatal than cancer, but distinguished from it by peculiar characters, which, not being confined to age, sex, or part of the body, attack the eyeball both of the infant and adult.—*Scarpa, Treat. de Oculis*, p. 93, et. 2.

According to Scarpa, and, indeed, the sentiments of several other surgeons of the present day, cancer is always preceded by scirrhus, or a morbid induration of the part affected. At the dissection, however, it is then found scirrhus volens, an indurated fluid is formed by cells within it, and afterwards extends towards the external surface of the tunic, causing elevation of the areolar parts. The compact and apparently fibrous mass is then incised, and a malignant fungus discovered, of a livid, or sanguineous color, with white coated and irregularly enlarged, and with a discharge of acrid, offensive mucus. The surface comprising the base of the malignant fungus, instead of increasing in size, now rather diminishes, but retains all its original hardness, and, after using a certain way above the elevated surface, is destroyed at various points by the same elevated process from which it originated, and if any part of the livid fungus now seem disposed to sink, it is a deceitful appearance, as, in a little time, the smooth point again started by elevation. To relate in this place all the differences between cancer and fungus keratoides of the eye would be superfluous, as the subject is considered in a future article (see Fungus Keratoides); but I may briefly advert to a few remarkable points of diversity. 1st. The primary origin of fungus keratoides is generally in the retina, especially that part at which the optic nerve enters the cavity of the eye. 2dly. True cancer of the eyeball, when it begins on any part of the organ itself, instead of commencing as fungus keratoides at the deepest part of the eye, originates on its surface in the conjunctiva; and, as it is at present confined externally, if we expose the lachrymal gland, this epithelium is the only tunic connected with the eye, and externally united with conjunctiva.—*Scarpa, de Oculis*, p. 209, et. 2, and *Traversi, Synopsis of the Diseases of the Eye*, p. 93. 3dly. Cancer of the eye, as Scarpa truly observes, is less destructive than fungus keratoides, and that for two important reasons. In the first place, because, although begun in the exterior parts of the eye, so that whatever relates to the origin and progress of the disease is open to observation; and, secondly, because the malignant fungus of the eye, on its first appearance, is not actually malignant, but becomes so at a period of time, or two entire treatments, particularly in which every good eye

may be employed with effect. In this light Scarpa views many appearances on the conjunctiva and external lamellae of the eye, which appear in common with a malignant disease of the cornea, and exposed to be an abscess and ulceration; these, which arise from relaxation and chronic inflammation of the conjunctiva, once cured, then of the nerves, regulated by antispasmodics, freed from violent opacities, set of a conjunctival nature, treated in the same way with antispasmodics and relaxing applications; from suppuration of the eye, rupture of the vessels, and bursting of the eyeball; and from these same terms on the part. Nothing, says Scarpa, is more probable, than that all these morbid things were, in their first appearance, total indolence, chronic, or certainly not cancerous, and that many of them were so actually at the time of a successful operation being done.

Now, in the opinion of the same valuable author, there is something as yet known of the precise time when a scirrhus of the eye changes from the state of a common elevated fungus to that of carcinoma; for the exquisite sensibility, cutting pains, rapidity of growth, color, and various discharge are not an adequate proof of cancer. The symptom, however, on which he is inclined to place the greatest dependence, as a mark of the change in question, is the acute cartilaginous hardness of the lividly indurated fungus, which induration, he asserts, is not met with in the benign fungus, and never fails to precede the formation of cancer.—(See Scarpa, *On the Eye*, transl. by Briggs, vol. 2, p. 311—312.)

4thly. The last indication of fungus keratoides from cancer of the eye here to be noticed, is the pale appearance of the whole of the diseased mass in its first three diseases; a character completely opposite to the first acute cartilaginous resistance of the malignant fungus.

Before describing the operations of removing an eye affected with malignant disease, the following conditions, drawn by me, should be recited. 1. The conjunctival calyx, on the eye, for the cure of fungus keratoides, although performed on the first appearance of the disease under the form of a yellowish or deeply seated in the eye, is useless, and rather accelerates the death of the patient.

But although this statement, made by Scarpa, may be mostly true, I am happy to say, that modern experience begins to raise a hope that operations in the foregoing reluctantly inference are possible. Thus Dr. Watson removed from a boy also attacked with retina and lens affected with fungus keratoides almost six months, and no relapse had taken place eighteen months after the operation.—(See Edin. Med. and Surg. Journ. No. 54, p. 51.)

2. The exterior fungus keratoides of the eye, commonly called carcinoma, beginning on the conjunctiva and anterior lamellae, which it is soft, flexible, and juicy, although accompanied with symptoms akin to those of carcinoma, is not actually this disease, till it does become indurated and strictly cancerous; and it is rigid, hard, corneous, sharp, and is very inoperable.

3. The interior fungus keratoides, hard to the touch in all its parts, covered with elevated spots, which has involved the retina of the whole of the eye, and surrounding parts, and rendered the base of the optic nerve, and communicated the sympathetic glands behind the verge of the eye and in the neck, is curable.

4. On the contrary the partial or local extrusion of the eye will succeed when attempted before the malignant fungus keratoides has changed from the state of indolence to that of a scirrhus, crusty, and cartilaginous hardness.—(Vol. cit. p. 308.)

The operation of removing the eye was first performed in the sixteenth century by Barrois, a German, who employed a severely constructed compound shaped like a spoon, with cutting edges, and by means of which the eye was separated from the surrounding parts, and taken out of the orbit. This instrument was too broad to admit of ready introduction in the eye connected part of the orbit, so that when it was used either a part of the disease was likely to be left behind, or the thin lamellae of the orbit to be fractured in the attempt to pass it; many thereby also lost their eyes. Fabricius Hildanus improved these instruments from experience, and in order to avoid them, devised a sort of probe-pointed scissors.—Haller trans. Hist. of Wounds and a pointed history.

FEV

FEV

FEVERS, SURGICAL. Under this head may be comprehended two species of fever, viz. one inflammatory and the other, which are particularly interesting to surgeons, because frequently attendant on surgical diseases.

In treating of inflammations, I have mentioned that a febrile disturbance of the constitution is attendant on every considerable inflammation. In the present article, some account will be given of the particulars of this disorder.

The fever itself is to be described as known, and distinguished by several names; some calling it reflex, others, more symptomatically, and others systematically; it is supposed by some writers to be sometimes constitutional; that is, to originate at the same time with the local inflammation, and from the same cause.—(J. Barrow.) In other instances, and indeed, we may say, in all surgical inflammations, it is symptomatic; or, in other words, it is produced not directly by the causes which originally produced the inflammation, but as consequent on the sympathy of the whole constitution with the disturbed state of a part.

Mr. Trautwein's opinion seems clearly to coincide with those of Mr. Barrow, though differently expressed. He considers constitutional irritation to be of two kinds, direct and reflected; by which he explains, "that the first is widely and immediately derived from the part, and the second is identified with the local mischief, and the constitution has no share in its production."

The second, as the contrary, expresses in a passive or inert state of the constitution, in which the injury or inflammation has given birth, or it may be previously existing. The first is truly symptomatic, never originating spontaneously, and being immediately induced by the local irritation, as capable of being essentially assigned or removed by its removal. The second is essentially purely sympathetic, and being either the cause, then the effect of the local action, is seldom induced by the local treatment. In the first, the local changes are dependent on local causes; in the second they depend on constitutional causes.—(See *Trautwein on Constitutional Diseases*, p. 107.) As the symptoms reflect on the system, if understood in its literal sense, involves the reader in an hypothesis which is perhaps not correct, but not less an advantage in the comprehension of it. Used figuratively, however, it may be as allowable as many other expressions in medical language.

Malignant inflammatory fever is said to be always preceded by chilliness. The sympathetic or sympathetic inflammatory fever sometimes takes place so quickly in consequence of the violence of the exciting agent of the local inflammation, that no preceding chilliness is observable. If, however, the local inflammation be more slowly induced, and consequently system more gradually of the system, then the chilliness is evidently preceded. The sympathetic fever, induced by swelling or tearing a part, is quickly produced, and we have very little time to spend in the critical period of its accession. On the other hand, the sympathetic fever induced by wounds is excited more slowly, and the period of its formation is longer. This fever is not produced when an inflammation may extend to a slight degree; but it follows its appearance if the local inflammation be considerable, or if a violent very movable part.—(Barrow.)

The disorder in which the sympathetic fever is evident, they are altogether beyond the scope of the present inquiry on evidence of the inflammation; but in a great measure, from the degree of the local inflammatory action, accompanied with the various pains and motion of the part affected. Parts in which the action is naturally slow, are extremely painful when inflamed, and the system sympathizes greatly with them. Hence the constitution is very much affected when tooth-ache, burns, or ligatures are the parts inflamed. Severe inflammation of a large joint, every eye being is apt to excite the most alarming, and even fatal development of the system. When very movable parts are inflamed, as, for instance, the eye, the sympathetic fever is generally more considerable than it would be,

were it to come from an equal quantity and degree of inflammation in a less movable organ.

If, however, parts, as muscles, with the tendons, skin, &c., the symptoms will be acute; the pain strong and full, and the heat so of the inflammation be long the heat; but perhaps not so quick as when the part is far from it. The warmth will extend to the head, and the blood will be pushed forward to the most vessels.

If the inflammation be in tendons, ligaments, or long parts, the symptoms will be less violent, the pain with sympathetic more, the heat will not be so full, but perhaps quicker; there will be more mobility, and the blood, not being propelled so well to the vessel vessels, will forward the skin.

It seems to be a general circumstance, that the inflammation be in the upper or lower extremity; that is, far from or near the heart; for the symptoms are more violent, the constitution more affected, and the power of resolution less, when the part inflamed is far from the source of the constitution, than when near it, even when the parts are similar, but is better and true.

If the heart or lungs are inflamed, either immediately or secondarily, by sympathy, the disease has more violent effects upon the constitution than the most sympathy of inflammation would have. If the part inflamed were not a vital part, or one such which the vital part did not sympathize. If the part be such as the vital part readily sympathize with, then the sympathetic action of the labor will affect the constitution as by inflammation of the system. In such cases the pulse is much quicker and smaller, and the heat is more than that of the inflammation with a more part, such as muscle, cellular membrane, and skin.

When the stomach is inflamed, the patient feels oppression and distension through all the stages of the inflammation; the pulse is generally low and quick, and the pain strong, strong, and spasmodic; such is the patient can hardly bear. If the inflammation be not affected, the same symptoms take place, especially if the inflammation be in the upper part of the canal; but if only the canal be affected, the patient is more relaxed, and the pulse is fuller than when the stomach itself is inflamed. When the bowels are inflamed, the pulse is extremely quick and low. When the inflammation is either in the intestines, bladder, or uterus, the pulse generally sympathizes. In inflammation of the liver, the pulse rises more than in the same action of any other part; and perhaps we must, in this instance, give a judgment of the constitutional state than other symptoms than the pulse.

When inflammation is situated in a part, as very essential to life, and sometimes the general affection of the system, called inflammatory fever, the pulse is full and strong; such common, and the blood is pushed further into the surface arteries than when the action is in a vital part. The patient, after some increase of heat, is at first rather cool. The pulse is as above described, when the constitution is strong and healthy; but if this be extremely weak, it will be weak as in many women who had sometimes the pulse may be quick, hard, and small, as in the case of the constitution of the inflammation, just as if the patient were concerned. The blood may also be very, but it will be loose and flat on the surface.—(Barrow.)

The kind of constitution makes a great difference, and as Mr. Trautwein has justly observed, "it is extremely necessary to illustrate the influence of a considerable temperature upon the consequences of some system of disease. Practically, we all know it well. We say, such a person could be a hot patient, as a cold patient, and whoever knows the symptoms of resolving morbid action or suppuration, but under treatment of one and the other case, and knows the impact of this phlogon, and that the greatest degree of mischief is often accompanied by the least constitutional disturbance, and for this reason it seems and most perfectly revealed. The first few hours will enable an experienced observer to determine whether the subject of a serious injury or operation

will do well or otherwise. Here again different is different individuals in the manifestations attending such remote developments as a skin, an enlarged gland, a wheal, or a simple ophthalmia. In some, the inflammation seems general of the affluents, and the individual pursues the ordinary complexion. In others, the whole system sympathizes; the spirits are ruffled; the tongue acquires the opposite tinge; the pulse acquires an undue bound; and the white tongue, the crimson children, and slight erratic pains of syphilitic fever are absent. (Threats on Constitutional Medicine, p. 13.)

We may set down the ordinary symptoms of inflammatory fever, consisting in congestion of local inflammation in common parts and in a febrile habit, as follows. The pulse is frequent, full, and strong; all the secretions are diminished; the patient is violent and restless; the perspiration is obstructed, and the skin is hot and dry; the urine is high-colored and in small quantity; the intellect is purified and the senses sharpened; an oppression chest is experienced; with disturbance of the nervous system, loss of appetite and sleep; and, in some cases, delirium.

SYMPTOMS OF INFLAMMATORY FEVER.

That this part of the subject may little be so to be said, far as it relates to the ordinary febrile disturbance of the system is produced and entirely kept up by the local inflammation, it must be evident that the means employed for diminishing the exciting cause are also the best for abating the constitutional effects. Hence it very seldom happens that any particular symptoms are adopted expressly for the fever itself; as this affection is sure to subside in proportion as the local inflammation is lessened or removed. But within the febrile disturbance is considerable, and the indication itself is also considerable. The slightest state of the system may have more than a share in keeping up and even increasing the local affection, and should be quieted as much as possible. However, in these very instances, in all probability, we should be led to a more express adoption of the antiphlogistic plan of treatment, by an indirect consideration of the state of the local inflammation itself, without any reference to that of the constitution. Indeed, the increased action of the heart and arteries, and the suppression of the secretions, require the employment of anaphrodisiac means and antispasmodics, the very same things which are indicated for the reduction of the local inflammation itself. Bleeding, purging, cold drinks, &c., the subjects of the antiphlogistic treatment, James's powder, or the common acetous powder; and bathing the feet and body in warm water, are symptoms which have the greatest efficacy in tranquillizing the constitutional disturbance, inspired by the febrile inflammatory fever. But I think it right to repeat, that it is hardly what necessary to have recourse to such an exhibition as general bleeding merely on account of the fever; as this is only an effect which invariably subsides in proportion as the local cause is diminished.

As Mr. Thomson has remarked, "the inflammatory fever, depending on external injuries or on chirurgic operations, undergoes a kind of natural crisis by the appearance of suppuration. In these instances, therefore, it is when the patient is strong and full of health, when the disease is seated in an organ of small importance to life, or in a danger of suppuration, as in the case in an inflammation of the parotid gland, that the three great crises of the febrile, the least ought to be used with caution. For we say, by the use of a detraction of blood, produce a sudden sinking of the powers of life, and convert the existing inflammatory symptoms into fever of a different type or character. But in all cases of inflammation in which any detraction with regard to the former general attraction of blood is necessary, it is better, as I have shown as a general rule, that it is better to employ local than general blood-letting." (Lectures on Inflammation, p. 116.)

HECTIC FEVER.

The sympathetic or sympathetic fever already described is an inevitable affection of the constitution, in consequence of some local disease; hetic fever is a remote effect. When hetic fever is a consequence of local disease, it has commonly been preceded by inflammation and suppuration. And there is an ordinary

to produce granulation and contraction; and the cure, of course, cannot be accomplished. The constitution may now be said to be oppressed with a local disease of instance than which it cannot deliver itself.

A distinction should be made between hetic fever arising entirely from a local complaint in a good constitution, which is only described by too great an irritation, and hetic fever arising principally from the bad state of the constitution, which does not dispose the parts to heal. In the first species it is only necessary to remove the part of irritation, and then all will do well; but in the second, nothing is gained by a removal of the part, unless the wound made in the operation is healed, and there is a tendency for the constitution to heal under this state and the operation together, thus under the former disease. Here the great distinction is to be made. (Hector, p. 116.)

Owing to a variety of circumstances, hetic fever assumes various degrees of intensity, and the inflammation, and consequent oppression, become more or less, having the powers of resistance than others, trace more easily fall into this state.

Hetic fever takes its rise from a variety of causes, which have been divided into two species with regard to distant parts, viz. parts called vital, and others not of this nature. Many of the causes of hetic fever, arising from diseases of the vital parts, would not produce this constitutional affection if they were in any other part of the body; such, for instance, is the disease of the lungs, either in, or so situated as to press upon a vital part, or so where functions are immediately connected with life. Sores in the stomach and mesenteric glands, diseased lungs, liver, &c. very soon produce hetic fever.

When hetic fever arises from a disease of a part that is so vital, it commences sooner or later, according to it is in the power of the part to heal or continue the disease. If the part be far from the source of the irritation, the fever will come on sooner with the same quantity of stimulus. When the disease is in parts which are not vital, and causes hetic fever, it is generally in suppuration, where so much resistance happens as to affect the constitution; and where the powers of healing are little. Thus in the case with disease of many of the parts. We must also include some which have a tendency to such specific diseases as are not readily cured in any situation.

Although hetic fever commonly arises from some local disease of a vital part, or from an extension of disease of a convalescent part, yet it is possible for it to be an original disease in the constitution, without any local cause whatever that can be specified.

Hetic is a slow mode of disorganization; the general symptoms are those of a low or slow fever, attended with weakness. But there is rather less action than in weakness; for upon the removal of the hetic cause, the action of strength is immediately produced, and every natural function is re-established, however much it may have been previously impaired.

The particular symptoms are emaciation; a small, quick and sharp pulse; the blood smokes the skin; loss of appetite; frequently a rejection of all aliment from the stomach; want of a great readiness to be thrown into convulsions; spasmodic prostrations, when the patient is heated; pale countenance and very copious urine; and often a constitutional tingling.

Hetic fever has been imputed to the absorption of poisons into the circulation; but so early as the supposition has prevailed in the doctrine which ascribes to this cause many of the bad symptoms frequently attending persons who have sores. When suppuration takes place in particular parts, especially vital ones, hetic fever almost constantly arises. It also attends every inflammation before suppuration has actually taken place, as in cases of white swelling of the large joints. The same quantity and species of inflammation and suppuration in any of the body parts, especially such as are near the source of the circulation, have in general no such effect. Hence, in the first instance, the fever is only an effect on the system, produced by a local complaint that has a peculiar property.

The constitutional sympathies soon readily with diseases of vital organs, than with those of any other parts; these diseases are also in general more difficult of cure than the same affections of parts which are not vital. All diseases of lungs, livers, and kidneys,

ence for 1742, is the account of a child which was shown at one of the fairs, and had six toes on each foot, and the same number of fingers on each hand. In each foot there were six articulated toes, and in each hand an equal number of articulated fingers; but in the right hand there were only five, the only one of which had two articulated fingers, one for the little, and the other for the superfluous finger. In the *Copied Thesaurus*, T. Bartholinus has inserted the description of a very curious skeleton; on the right hand there were seven fingers, on the left six; and besides these contrivances, the thumb was double. On the right foot there were eight toes, on the left, nine; the right metatarsus consisting of six bones, the left of seven. Sydenham speaks of a still more curious case; he saw a man born with at the Hôtel Dieu, at Paris, which had six fingers on each hand, and two toes on each foot; the phalanges seemed as if they were all in a broken, imperfect state.—(Obs. et Cur.) The example of the greatest number of fingers, and toes as recorded by Voigt, including the thumb, there were thirteen fingers on each hand, and twelve toes on each foot.—*Mon. des Anomalies du Corps humain*, t. 3, p. 174. Full details are occasionally met with two thumbs on the same hand.—(Pontrich, *Obser.* 3, Obs. 4-5.)

It is always the individual number of fingers to remain would keep to deformity, and even finger inconvulsion, the surplus is called upon to atrophy them. The rudimentary fingers are sometimes wither away without a nail; but more numerous than one upon each hand, probably situated just on the outside of the little fingers; and, as far as my observation extends, incapable of motion, in consequence of not being furnished like the rest of the fingers with muscles. For the most part the phalanges are also imperfectly formed or deficient. The best plan is to cut off superfluous fingers with a scalpel in the place where they are wanted to the other part of the hand. The operation should be performed while the patient is in the infant state, that is to say, before the superfluous parts have acquired much size, and while the aged can be accomplished with the least pain. The phalanges ought to be made so as to form a wound with edges which will admit of being brought together with strips of adhesive plaster. As soon as the phalanges are applied, the incisions will almost always close without a ligature.

FISTULA. (From *fusus*, to curve around.) A very fine shock in a bone is so called.

FISTULA, in surgery, usually means a sore which has a narrow orifice, runs very deeply, is painful, and has no disposition to heal. The cause is evidently taken from the abscesses which the long cavity of such an ulcer has in fact a pin or rod. A fistula commonly leads to the emission of some discharge, keeping up suppuration; and from which place the matter comes readily escape. No fistulous cure has been more misapplied than this; and no misinterpretation of a word has had more influence in practice than that of the general one. Many surgeons, mistaking abscesses with small openings have for abscesses called fistulae, and being considered as in a rupture, and the treatment pursued has in reality at last rendered them so, and thus the only means of their not having healed.

FISTULA, IN AND, see *above*.

FISTULA LACRYMALIS. Is a very long language, this term has been applied only to one case, viz. that in which there is an abnormal opening in the lacrymal sac, established with any tendency to heal, and from which opening a quantity of purulent fluid is from time to time discharged, especially when the lacrymal sac is compressed. Such has been the confusion, however, respecting the nature of the disease of the lacrymal passages, and so great has been the force of ancient custom, that down to the present time the generality of British, as well as French, surgeons, apply the expression *fistula lacrymalis* to several forms of disease, totally different from each other, and hardly one of which bears name at all applicable. In order not to assist in perpetuating this absurd and erroneous plan, from which nothing but confusion and obscurity can result, I shall follow the example pointed out by Barr, Richman, and our countrymen. Mr. McKim, and consider the various forms of disease to which the lacrymal passages are subject, not under the head of *fistula lacrymalis*, but under the more accurate title, *Lacrimal fistula*, the name of the

FISTULA IN PERINEO. An Sir Astley Cooper has justly observed, increases in the greater generally last, and great facility; a fact amply proved by the frequent results of the lateral operation; but when abscesses are formed in the urethra, either from disordered states of the constitution, and the part together with the lateral abscess, and when they are accompanied with any considerable destruction of the sides of the urethra, and of the corpus spongiosum, they are mostly very difficult to cure.—(Surg. Essays, pt. 2, p. 211.)

When the methods recommended for the removal of strictures (see *Urethra, Stricture* &c) have not been attempted, or not succeeded, patients endeavor to relieve themselves by making a free passage for the urine, which, although it often prevents immediate death, yet if not relieved is productive of much inconvenience and misery to the patient through life. The mode by which patients endeavor to procure relief is by introducing the middle of that part of the urethra which is enlarged, and situated between the stricture and the bladder. Thus the urine becomes applied to a new orifice, irritating the part, and occasioning the formation of an abscess (see which the urine has access; and when the matter is discharged, it is by urine or by art, the urine passes through the abscess, and generally continues to do so while the stricture remains.—A. Cooper, *Surgical Essays*, part 2, p. 210.)

The stricture commonly begins near or close to the urethra, although the stricture may bear a considerable distance from the bladder. The stricture is often induced in the urethra, by which means it is removed, but ultimately this does not constantly happen. The stricture is always on the side of the urethra next to the external orifice.

The internal membrane and substance of the urethra having absorbed, the urine finally gets into the loose cellular membrane of the scrotum and penis, and diffuses itself all over those parts; and as this fluid is very irritating to them, they inflame and swell. The presence of the urine merely in the cellular membrane, from taking place, it becomes the cause of suppuration, whenever it is diffused; and the irritation is often so great that it produces inflammation, not only of the cellular membrane, and afterward in several parts of the skin; all of which, if the patient live, slough away, making a free communication between the urethra and external surface, and producing what are termed *fistulae in perineo*, though it is plain enough to every surgeon who knows the extent of the disease, that a recent opening, produced in the perineum by dissection or abscess, might not be called a fistula immediately it is formed, and at least not until it has acquired some of the characters specified in our explanation of the term *fistula*.

According to Mr. Hunter, when dissection takes place further back than the portion of the urethra between the glans penis and membranous part of the canal, the abscess is generally more considerable.

The urine sometimes penetrates itself into the corpus spongiosum, and is immediately diffused through the whole, even to the glans penis, so as to produce a suppuration of all these parts. A fatal instance of this kind is reported by Mr. C. Bell.—(Surg. col. 184, vol. 1, p. 98.)

Although the location of the urethra may be in the perineum, yet the urine generally passes early backwards into the scrotum, which contains the loose cellular substance in the body; and there it strikes a hardens collecting along the perineum to the scrotum, and in the track of the urethra.—(Hunter.)

Mr. Astley Cooper is of opinion, that as soon as the abscess, which is the forerunner of the fistula, can be plainly felt to contain a fluid, it is the best practice to open down with a lancet. The extensive destruction of parts by dissection will thus be prevented, the place not unfrequently even heals up spontaneously without any further advice being left, and a tendency to those dangerous extravasations of urine is also prevented, which if the abscess be not opened early, often prove destructive to life.—(Ibid. cit. p. 212.)

Dissection can only be prevented by destroying the urethra; but when the urine is diffused in the cellular membrane, the removal of the stricture will probably be too late to prevent all the mischief, although it will be necessary for the complete cure. Therefore, as surgery should be used to pass a bougie, by which the stricture may have been destroyed by the urethra, so

as to allow the instrument to be introduced. When this is the case, ligatures must be placed immediately, in order to procure as free a passage as possible. In these cases, Sir A. Cooper expresses a preference to flexible bougies, the size of which is to be gradually increased until their diameter exceeds the natural diameter of the passage. In some instances, however, he says, that it will be necessary to introduce a pewter catheter, of large size, and to adhere to it, as in the bladder, so as to cover it not upon the structure, and hinder the urine from passing through the perineal orifice. In this manner a permanent cure may often be effected. Although this experienced surgeon agrees with most surgeons of the present day, respecting the general expediency of employing bougies for the removal of a stricture, under the prevailing circumstances, yet he admits that sometimes to proceed gradually, in which, from long use, the stricture and the parts surrounding the stricture are so altered in structure, that no instrument can be passed through the obstruction without danger, and where the slow action of caustics is safer than the use of a metallic bougie. (*Surgical Essays*, part 2, p. 213.) The experience of modern surgeons tends to prove, however, that there are some cases which, from obliquity to the plan of employing bougies or catheters, though a temporary opening may have occurred in the passage. Various cases are the examples in which the aperture in the stricture was the consequence of absorption and absorption, unaccompanied by stricture, and taking place in a bad constitution, and perhaps only preceded by a slight discharge from the ureters. Here bougies would increase the tendency to absorption, and aggravate the local and constitutional irritation. (*id. Cooper*, p. 216.)

While we are attempting to cure the stricture, antiphlogistic measures, particularly bleeding, are to be adopted. The parts should be exposed to the action of hot water; the warm bath made use of; ointments and suppositories made use of; the mouth and in general, with a view of diminishing any sympathetic affection. Say, as Mr. Hunter observes, of these proceedings we often find ourselves, and therefore an immediate effect would be made, both to loosen the bladder, and to prevent the further effusion of urine, by making an opening in the urethra somewhere beyond the stricture, but the better is it the better.

Introduce a bougie, or some such instrument, into the urethra, as far as the stricture, and make the end of it as permanent as possible, so as to be left, week, indred, is often impossible. If it can be left, it must be put upon, and the insertion carried on a little further towards the bladder or ureter, so as to keep the bottom beyond the stricture. This will both allow the urine to escape, and destroy the stricture. When instrument cannot be left in, then by the ligature, we must cut down towards it; and as afterward doing it, proceed as above.

When the stricture is opposite the ureters, as the opening cannot be made in this situation, it must be made in the perineum, in which case, there can be no absorption given by an instrument, so it will not pass unassisted far, and the only guide is our anatomical knowledge. The opening being made, proceed as directed in the cure of a false passage. (*See Croonian, False Passage &c.*) In whichever way the operation is done, a bougie, or a catheter, which is better, must afterwards be introduced into the wound healed over it.

When the inflammation from the introduction of urine is attended with suppuration and mortification, the parts must be freely excised, in order to give vent both to the urine and gas. When there is sloughing, the incision should be made in the mortified parts.

Sometimes, when the urethra is divided, and the cellular membrane of the penis and prepuce is so much destroyed as to produce a phymosis, it is impossible to find the orifice of the urethra.

Frequently the new passages for the urine do not heal, or, in course of the stricture are being removed; and even when they have healed, they often will not heal, but become truly fistulous, and produce more inflammation and suppuration, which often leads to constant suppuration. Such new openings and openings often form in consequence of the former cure having been too small before the obstruction in the urethra is removed.

Really diseases sometimes being an infectious disease, which do not yield to cure, but cause as much as the fistula and course of the urinary have been cured.

In order to cure fistula in perineum, attended with the above-described, urgent symptoms, the fistula must be removed as free as possible, and this alone is often enough; for the urine, finding a ready passage forward, is not forced into the internal mouth of the fistula, which therefore heal up. The cure of the stricture, however, is not always sufficient, and the following operation becomes indispensable.

The stricture is to be laid open in the same manner as other diseases, which leave no disposition to heal. In doing this, as little as possible of the sound part of the urethra must be opened. Hence the surgeon must direct himself to the inner orifice of the fistula, by means of a staff, introduced (if possible) into the bladder, and a probe passed into each of the fistulous passages. The probe should be first bent, that it may more readily follow the turn of the fistula. When it can be made to meet the staff, so much the better; for then the operation can just cut only what is necessary.

When the fistula is so straight, as to admit of a catheter being introduced, this instrument is the best. When neither the probe nor the catheter can be made to pass so far as the staff, we must open the stricture as far as the first catheter will go, and then search for the continuation of the passage, till the purpose of laying it open. The difficulty of this dissection, however, is the thickness, disordered state of the parts in the stricture and perineum, so that as you only lay it open by a catheter, you will have little more the attempt, himself, or sent it made by others. I have myself seen one of the first anatomists in London fix in two instances the continuation of the stricture, and failed in their attempt, therefore, to pass an instrument into the orifice of that passage into the bladder. The difficulty and confusion, arising from the fractured, enlarged state of the parts, which, and so to be cut, have been well described by Mr. C. Bell. (*Surgical Obs.* vol. 1, p. 178.)

Having divided the stricture as high as the termination in the urethra, a catheter should be introduced and worn, at first almost constantly. This is better than bougie, which must be frequently withdrawn to draw the patient in make water, and it often could not be introduced again without being extended in the wound.

In many cases the continuation of the stricture should not be created after a certain period. At that time assists the cure, but, in the end, it may obstruct the healing, by acting on the bottom of the wound, as it is common body.

Hence, when the sore becomes suppurative, as there is danger to the children, and introduced only occasionally. And even after the sores are well, it will be prudent to use the bougie, in order to determine whether the cure is free from disease.

When fistula in perineum have been laid open, the wounds are to be cut first dressed down to the bottom as much as possible, which will prevent the return of the urine and blood, and make the granulations shoot from the bottom, so as to communicate the union by one loaded union. (*Chamber on the Venereal Disease*, ed. 2.) Additional observations upon this subject, and, in particular, the opinions of Desault, will be found in the article *Venereal Abscess and Fistula*. Sir A. Cooper's practice, in cases where a considerable portion of the urethra has been destroyed, will be found in the article *id.* (*See Croonian*.)

FISTULA SALIVARY. See *Fistula Dent.*

FLUTEATION. (From *fluteo* to flute.) The perceptible motion communicated to any collected of pleuritic matter, in any kind of fluid, by applying the fingers to the surface of the cavity, and pressing with them alternately, in such a manner that the finger of one hand must be employed in pressing, or rather in breaking tapping than the rest, while those of the other hand remain lightly placed in apposition to the swelling. When the ends of two set of fingers are thus delicately applied, and the extreme layer of water is moved gently with the fingers of the other hand, the region given forth has a manifestly perceptible vibration, and the sensation thus received is one of the principal symptoms by which practitioners are enabled to discover the presence of fluid in a great variety of cavities. It is according to the touch the perceived fluid in parts, or being excited with the finger, as it is normal, distinguishes the sign of exudation as remarkable, perhaps as any quality that can be applied.

When the collection of fluid is very deeply seated, the fluctuation is frequently exceedingly obscure, and

sometimes not as all disposable. In this circumstance, the presence of the fluid is to be ascertained by the consideration of the symptoms. For example, in cases of hydroceles, ascites, and erysipelas, surgeons do not expect to find the manipulation of the fluid in the thorax with ease; they remember the patient's difficulty of breathing, the tumour extending the lying upon one particular side, the order of the position of the chest, the physical affection of the lungs, the case raised and settled position of the ribs in the affected side, the preceding rigors, fever, and several other circumstances, from which a judgment is formed, both with regard to the presence and the physical nature of the fluid.

PUNCTATION. By a punctation, surgeons commonly mean the application of flannel or canvas, wet with warm water or some medicinal decoction. In the practice of surgery, punctations are made of two or three parts, and sometimes of four, and are made in the following manner. Some punctations are made, however, are used for punctations, with a view of allowing by means of these medicinal qualities, warmth, moisture, and other sorts of a specific action. I shall merely mention a few of the most useful punctations in common use.

PUNCTUM AMMONIACI MURIATICI. R. Rosinam communi ʒij. Alcoholi, m. ʒj. Spirit. Sassa. ʒij.

Just before using the hot direction, add to it the ammoniac resin and spirit. Read to be of service in some scalded blisters; and, perhaps, it might be of use in promoting the absorption of some morbid, and superfluous matters.

PUNCTUM CHAMÆMELI. R. Chamæmeli ʒij. Alcoholi ʒij. Phlegmæ capivi, m. ʒij. A decoction in every common use.

PUNCTUM CINI. R. Pulv. cinis recent. ʒij. M. rosi recent. ʒij. Alcoholi ʒij. Chamæmeli ʒij. A decoction in every common use.

PUNCTUM GALLÆ. R. Gallæ comest. ʒij. Alcoholi ʒij. M. rosi recent. ʒij. Alcoholi ʒij. Chamæmeli ʒij. A decoction in every common use.

PUNCTUM PAPAVERIS ALBI. R. Papaveris, m. ʒij. M. rosi recent. ʒij. Alcoholi ʒij. Chamæmeli ʒij. A decoction in every common use.

PUNCTUM. An instrument which is employed in surgery for a variety of purposes, and having accordingly various constructions. The general design, however, of surgical forceps, is to take hold of substances which cannot be conveniently grasped with the fingers; and, if necessary, the instrument is always formed on the principle of a pair of shears, having two blades, either with or without handles, according to the construction. The smallest handle is that which is employed in the operation of extracting the cranium, and which is used for turning any part of the cranium from the point after the chief part of the operation has been done.

Another forceps, of larger size, is that used for taking up the matter of the arteries, when these vessels require a ligature, in cases of hemorrhage. This instrument is also frequently employed for taking dressings off wounds, removing pieces of dead bone, foreign bodies from wounds, and particularly for securing the blood, which are about to be cut, in all operations where careful dissection is required. This forceps resembles that which is employed in every case of dissecting instruments, and is often called the artery or dissection forceps, from its most important use.

Neither of the foregoing forceps is made with handles; such ones as are used in surgery; and the ends of the blades only come into contact when pressed together by the surgeon.

The following kinds of forceps are constructed with handles, by means of which they are both opened and shut.

1. The common forceps, contained in every pocket-case of surgical instruments, and used for removing dressings from wounds, extracting dead pieces of bone, foreign bodies, &c.

2. Larger forceps, employed for extracting polyp.

3. Forceps of different sizes and constructions, used in the operation of lithotomy, for taking the stone out of the bladder, or for breaking the calculus, when it is too large to be extracted in an entire stone.

4. Drawing forceps, as the common bone-spreaders, and the sharp forceps, made with the edges in the same line with the handles, used by Mr. Lisner for the division of bones.

REACTURE is a situation of continuity of one or more bones, produced in general by internal force; but occasionally, by the powerful action of muscles, as in some amputations in the human body.

The subject of fracture is so interesting a branch of surgery, and the knowledge themselves so important and important, that the title which English surgeons have done for the improvement of this part of their profession cannot but cause equal surprise and regret. Mr. Pott, it is true, made many extremely observations on the treatment of fractures in general, and his remarks on compound fractures in particular are in some respects the best which are extant; but what surgeons will now promise to forget the weak arguments upon which he has founded the doctrine of paying unqualified attention to the mistake of the fracture, as if this were an object which should constantly supersede every other consideration, and invariably regulate the posture of the limb? I have no business in detaching my own mind from the doctrine and practice recommended by Mr. Pott, in regard to fractured limbs, but I shall observe, however, that the doctrine, as it is, is not a new one, and that the doctrine, as it is, is not a new one, and that the doctrine, as it is, is not a new one.

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time; 4. Their prognosis; 5. Their treatment; 6. The formation of callus.

The subject will thus coincide with a full account of the symptoms, causes, and treatment of the fractures of particular bones.

1. Differences of Fractures.

The differences of fractures depend upon what bone is broken; what portion of it is fractured; the direction of the fracture; the respective positions of the fragments; and lastly, upon circumstances accompanying the injury, and making it simple, compound, or variously complicated.

1. As to respect to the bone affected.—Sometimes it is one of the long bones, as the humerus, the ulna, or the radius. Sometimes it is a short bone, like the scapula; and far more commonly it is one of the long bones. The position and function of the long bones render their fractures important. The bones of the skull are the only exception to this remark; for they are often broken; but here the assistance of the integument is required less for the sustenance of the continuity itself, than for the affection of the brain, and the extravasation of blood, with which the case is apt to be complicated. Fractures of the short bones are still less common, because these bones, being nearly equal in their three dimensions, are capable of greater resistance, and are not much within the reach of external violence. Besides, most of them are but little exposed to the operation of external force, by their situation, or situation. Hence, except when limbs are crushed, fractures of short bones are generally caused by particular causes, which frequently break the joint, or scapula, and occipital. The long bones, which serve as pillars, or arches of support, or levers, are, from the very nature of their function, particularly liable to fractures.

2. As to respect to the part of the bone broken.—Bones may be fractured at different points of their length. Most commonly, their middle portion is broken, and in this circumstance they usually break like a stick, which has been bent beyond its extensibility by a force applied at each end of it. Sometimes the fracture occurs near, or less near the extremities of the bone, which is always an unfavorable event. Lastly, the bone is sometimes broken in several places, and therefore may be produced by two different causes, which operate successively, or simultaneously, upon the broken parts of the bone; or it may be occasioned by one single cause, which acts at the same moment upon several points of it. These differences of fracture, deduced from their particular situation (says Boyer), are not always of essential relevance; they have a truly important influence over the progress and treatment.

3. As to respect to the direction in which the bone is broken.—A bone may be fractured in various ways, and the fracture produces different issues, according to its direction in regard to the axis of the bone. Thus, fractures are distinguished into transverse and oblique. The obliquity renders the surface of the injury larger, and especially increases the difficulty of maintaining the ends of the bone in contact, after the fracture has been set. Oblique fractures are subject to considerable variety, which depends upon the degree of their obliquity, and whether they are partly oblique and partly transverse. When a bone is broken in different places at once, and divided into several fragments, or splinters, the fracture is termed comminuted.

Boyer has added another class of fractures, viz. longitudinal.—See *Traité des Maladies des Os*, t. 1, p. 357. But such cases were regarded by J. L. Pons as only imaginary, because he conceived that any blow, capable of breaking a bone longitudinally, would which more easily cause a transverse fracture. For the same reason, Lescau absolutely rejected the possibility of longitudinal fractures, and this sentiment has prevailed down to the present day.

The following case, however, is related by Leveillé, in order to prove the possibility of longitudinal fractures. He expressed the faith of an American soldier who was put under his care in the year 1790, in consequence of being struck by a ball in the lower third of the leg at the house of Marseilles. The soldier had washed several times, after receiving the injury, before he arrived at Paris. The wound appeared simple and likely to heal, as soon as the injured portion of the thigh had healed. The event turned out otherwise, and the thigh was amputated.

Leveillé has preserved the thigh, upon which the impression of the ball may be distinguished, and from this point run several longitudinal and oblique lines, which extend from the lower third towards the upper border of the thigh, and pass through the whole thickness of the portions of the medullary canal. They were acknowledged to be really longitudinal fractures, by Boissier, Chappuis, Dumont, Deschamps, and Rivin, who were appointed by the *Académie de Médecine* to prepare the report.—(Gazette, *Journal de Médecine*, t. 2, p. 126.)

In several cases of fractured thigh-bones, there is great violence, which seems under the control of Dr. Cole and myself at Montreal, the same was again longingly to the extent of several night hours. The fact, however, that violence and other have produced longitudinal fractures, is more universally admitted; and even there may doubt upon the subject, a surgeon has been engaged by my friend Dr. Cole, would not permit it. Boyer, who, a few years ago, denied the possibility of longitudinal fractures, in his late work remarks: "In these cases, however, it is not the place of the bone, but the force which is applied, which is the cause of the fracture, which renders it difficult to prevent the possibility of a simple longitudinal fracture."—See *Traité des Maladies des Os*, t. 2, p. 107.

4. As to respect to the respective position of the fragments.—These differences are highly important to be considered, because, as Boyer remarks, the position of the fragments contains almost entirely in itself the prognosis, the displacement of the fragments. It is not to be supposed, however, that such displacement is an absolutely essential symptom of all fractures, as if sudden motion in members supposed of such bones when only one of them is broken. Neither does it constantly happen in every fracture at the neck of a bone, as is especially the case in fractures of the neck of the thigh-bone, the fragments of which sometimes carry their relative situation fully when the patient tries to walk, or the limb is spontaneously moved about. Fractures of the leg are also common, in which there is neither a displacement of the fragments, nor in which the shape of the limb, especially when the thigh bone is fractured near its upper part, where it is very thick. When the thigh bone is broken at its upper part, there is usually every displacement. The only possible position of the fragments having a large interval cannot be separated, or can only be so with difficulty. Fractures of the tibia are also frequently accompanied with displacement. But it is a symptom that almost constantly occurs when both bones of the leg or forearm are fractured together, as, also, in fractures of the tibia which contain only one bone, on account of the little extent of the surface of the fracture, and the great number of muscles which tend to displace them.

The displacement may happen in respect to the direction, length, direction, or circumference of the bone.

As to respect to the direction.—Transverse fractures are the only ones in which this kind of displacement is observed. The two fragments may either be in contact at a part of their surface, or they may not be in contact at all. In the latter circumstance, the limb is shortened by the ends of the fracture slipping over each other.

As to respect to length.—This mode of displacement, in which the ends of the broken bone pass one or two over each other, commonly occurs in oblique fractures, and sometimes in transverse ones, when the distance between the junction of the diameter of the bone has been such that the surfaces of the fracture are in contact. It will be hereafter explained, that whenever this limb is displaced in fracture at the articulation, it is the lower fragment that is displaced.

We may refer to the species of displacement both spoken of, that which takes place in fractures of the radius, ulna, and scapula; but with this difference, that the fragments, instead of passing over each other separately from each other in the direction of the length of the bone, and continue separated by an interspace more or less considerable.

As to respect to the direction of the bone.—In this kind of displacement, the two fragments form a single mass of bone, and the line appears united. It is principally observed in comminuted fractures. It may also happen in simple fractures; for instance, in the leg, where the limb is in a straight position, and the

the open a surface exactly horizontal, and the head is lower than the rest of the limb. The angular projection is then anterior. On the contrary, if the head is posterior, if the limb were too much raised.

In regard to the circumference of the limb.—This displacement series within the lower fragment performs a rotary movement, while the upper one continues stationary. There is fracture of the neck of the femur, if the limb is fully extended by the apparatus, its weight, together with that of the limb and the action of the muscles, will be so extensive, and cause the lower fragment to be drawn upwards.

Besides the simple displacements thus described, there are others of a more complicated nature, which happen in several situations at once. For example, such is the displacement observed in a fracture of the thick bone, when the lower fragment is drawn upwards and upwards, while the limb is turned upwards.

Let us next consider the causes of the displacement of fractures.

The bone, being only passive instrument of locomotion, passive not, in their own organization, any cause of the change of position which takes place; but yield to the action of external bodies, the weight of the muscles, and the action of the muscles.

The displacement may be produced by an external force, either at the moment when the fracture happens, and by the very action of the fracture itself; or it may be caused by the weight of the body when the fracture precedes the fall; or lastly, it may be brought on by some other external force, acting on the fragments, sooner or later, after the occurrence of the injury.

The outward motion, which is productive of a fracture, operates sometimes directly on the situation of the bone of continuity, sometimes on parts of it, as on one distant from the joint. In both cases, the action of the force is not confined to the production of the fracture, but is partly spent in causing a displacement of the fragments.

Fractures are generally occasioned by falls. Sometimes, however, the fall does not happen till after the leg is thigh is already broken. The weight of the body then produces the displacement, by pulling the upper fragment against the seat, which are more or less lowered. This is what happened to Andrew Paine, who, being kicked by a horse, endeavored to get out of the way, but instantly fell down, and the two bones of his left leg, which had been fractured, being impeded by the weight of the body, not only passed through the skin, but even through the socket and bone. After this case a case nearly similar in a young man about twenty years of age, who in a standing posture, was struck in the middle of the thigh with the pole of a carriage, which fractured the femur. The patient fell down, and in the fall the upper fragment was not only driven through the muscles and tendons, but also through the bone.

The weight of the limb itself may produce displacement according to the direction of its transference of the bone, as already noticed. The patient, however, the limb, also, in lifting the patient and carrying him to his bed, may sometimes alter the relative situation of the fragments, and cause them to be displaced.

But of all the causes of the displacement of fractures, the action of the muscles is the common and most powerful one. Among the muscles surrounding a fractured bone, some are attached to the fragments, while length, and are equally considerable both the fragments. Some arise from the bone above, and are inserted either into that which is united with the lower fragment, or into the larger fragment itself. Lastly, there are others which arise from a point more or less distant, and terminate in the upper fragment. The muscles fixed to the thick bone furnish examples of these three arrangements. The triceps is attached to the humerus, the whole length. The biceps, antero-internal, and external, arise from the pelvis, and are inserted into the leg, a part with which the lower fragment is articulated, and all the portions of which it follows. The great head of the triceps is inserted into this fragment itself. Lastly, the flexor, pronator, and supinator, &c., arise from the humerus and pelvis, and are attached to the humerus, not far from the upper end.

The muscles attached to both fragments contribute very little to their displacement. They may, however,

draw them to the side on which they are situated, and thus change the direction of the limb. The triceps, especially in the middle portion, acts in this manner in fractures of the humerus, and renders the thigh convex anteriorly. The antero-internal tendons produce the same effect when the humerus is broken below its middle.

The displacement is principally owing to such muscles as are affixed to the lower fragment, or act with which this fragment is articulated. Suppose the humerus to be broken between its upper end and the insertion of the great pectoral. The muscle, acted by the humerus down, and then up, will draw the lower fragment upwards, and displace it by drawing it on one side of the upper fragment, which remains stationary. In fracture of the neck of the thigh-bone, the upper fragment, included within the capsule, remains, after its attachment is so made. All those which are affixed to the lower fragment, pull it upwards and backwards, in which direction the displacement is irregular. In all fractures, the lower fragment follows every movement made by the part to which it is articulated, and consequently the muscles which are attached to the bones of this part of the limb, become a powerful cause of displacement. Thus, in a fracture of the thigh-bone, the large, antero-internal, and long muscles, draw the leg, and with it the lower fragment, upwards, backwards, and backwards, so as to make the lower end of the fracture below in the inside of, that rather below, the upper end, the extremity of which then projects forwards and outwards. In a fracture of the leg, the gastrocnemius, soleus, and peronei muscles, acting upon the leg, pull the lower fragment of the tibia and fibula, and draw them to the center and posterior side of the upper fragment. For this, as well as every other case, the strongest muscles, in producing the displacement, draw towards their origin the end of the fracture on which they operate. And as the posterior muscles of the leg are far more numerous and powerful than those on the front of the limb, while those on its outside are not so numerous, by any means, the displacement tends to happen in the direction backwards and outwards. Whenever, therefore, a bone is fractured at a given point, a knowledge of the muscles will enable one to anticipate a priori in what direction the displacement will occur, if no force be taken to oppose it, and to prevent altogether from this particular cause.

Lastly, the muscles which are attached only to the upper fragment, may sometimes operate. In a fracture of the thigh situated immediately below the little trochanter, the psoas and iliacus muscles, as they pass, exert a powerful extension of the upper fragment, which elevates the integuments and forms a mass or less considerable projection near the side of the groin. But it is to be observed, that, in general, the displacement of the upper fragment is not constant, and that it is the lower one which is drawn out of its proper position.

The manner in which the displacement of fractures is effected by the action of muscles explains the circumstances which frequently attend these cases, especially fractures of the thigh, clavicle, and leg. This is a thing, a projection of the upper fragment, as it is, which is raised by the bone. One might believe, at first sight, that such projection is formed by the upper fragment, which, passing its natural situation, rises over the lower one. But, on the least reflection, it becomes manifest that the upper end of the fracture projects only because the lower one is displaced and drawn towards that side on which the strongest muscles are situated. Thus, in practice, in order to make the rising end of the bone (as it is termed) disappear, it is only necessary to reduce the lower fragment into its natural place. If, instead of doing this, pressure be made on the projecting part, the danger fails, and if the plate be not more closely pushed and confined, inflammation and abscessing of the integuments and other soft parts, and the conversion of the bone into a compound fracture, are likely to be the unfortunate consequence.

As to the circumstances with which fractures are accompanied.—The most important division of fractures is into simple and compound.

By a simple fracture is supposed a break in the continuity of one or more bones, without any external

sound, communicating internally with the partner, and aimed by the professional at the ends of the traffic line or beam. By a compound fracture, they signify the same sort of injury of a bone or bones, attended with a laceration of the integuments, which laceration is produced by the propulsion of one or both ends of the fracture.

The complex nature of compound fractures will be fully explained in the model of this article; the author indeed has been strongly touched upon in speaking of Amputation.

Fractures are said to be *complicated*, when they are attended with disease or accident, which render the individuals in the treatment more tedious, and require the employment of different remedies, or the pursuit of study operations, for the accomplishment of the cure.

Thus, diarrhea may be associated with severe degrees of dehydration, wounds of the soft parts, the injury of large blood-vessels, a disturbance of the alimentary and purificatory organs of the constitution, as the stomach, intestines, liver, spleen, pancreas, &c., which are said to retard the formation of urine, and render the urine more turbid.

The comparison of fracture with dissolution happens by walking, and it cannot occur unless the fracture has taken place first, or has been produced at the same time with the fracture, and by the same cause. When once the fracture has happened, the fragments are too sufficiently within the grasp of external forces, and are too portable, to admit of the bone being dissolved.

A patient with incontinence may be attacked by an active disease, which may render the treatment more difficult, and the cure slower.

[illegible]

2. Chain of Producers

Tolerances of freshwater snails to acid rain

In the first case are comprehended the simultaneous and reciprocal of the bones, the age of the patients, and their situation. Superficial bones are more easily fractured than those which are covered by a considerable quantity of soft parts. The fragments of rib bones resemble those of cancellous bone fractured than others; that the pelvis, which supports the trunk, is more liable to be fractured than the others. The clavicle, which serves to keep the shoulder in its proper position and support as an arched extremity of the motion of the upper extremity, is particularly subject to be broken. The greater volume of the quantity of the phosphate of lime in the structure of the bones, renders them brittle in proportion as no stronger is youth, and, in old men, the properties of the unorganized part is so great, that the bones are fractured by the slightest exertion. In children, the bones are organized upon both a greater principle to the earth, and the bones being consequently more elastic and flexible, are not so liable to be broken as in old men.

[illegible]

whose eye was locked on a person who "looked just like a marriage. Linda, who was voted that season's top player, was not a little surprised to find her eighth-grade experience the same late, one day in the was dramatic her presence in bed. It was then around that she had a power in her mind level. Her self-esteem, so that he knows of the same case in the 1980s film, and Dr. A. Cooper has met with others—some of the

According to Leville, the history of two men is related by Endrager, one of whom died miserably at the age of sixteen, having broken the *Arter* a short time before his death; and the other, after riding his mount very well for two years, and dancing for a year, became affected with rheumatism, and was with one knee swollen as it was barely running along the street. (Nauvoo Doctrine, Chap. 1, p. 160.)

Many extraordinary instances of transverse fusion to meristematic tissue and fragility of the leaves are again noted. Suffice it here to refer to the *Philosophiae Botanicae* of Hermannus Meib. in *Plant. Rorale* Ges. *monstr.* Art. Haidach's, *Epilata*, Nat. Cur. *dec.* 3, *ann.* 5, *obs.* 122; Gooden's *Classical Works*, vol. 9, 343-348; *Observationes* Clair, p. 258; Gmelin's *Institution of Botany*, vol. 1, p. 270, etc.—Observe also *Fraxinus* and *Abies* etc. in *op. cit.*

On the subject of fractures produced by lightning, Linnæus' recommendations as to perfect knowledge in Boreas, Mylius's Observations, Heron de Motte Goussier, Pappart's Works inserted in the Mémoires de l'Académie des Sciences, 1690, and the Treatise published at Vienna, in 1781, by Jean de Boer. The reader would almost wish Lord Apsch's Voyage, in which the effect of lightning in producing the absorption of the vessels of the fractures, and a description of the fragments, is very curiously exemplified.

Paris, Prague, Calicut, and several other cities are known to be a preexisting sites of fissures. This fracture has originated from three regions: from more frequent at the water line, but it is also in rivers, seas, in cold countries, the greater number of falls which happen in winter from the supply and very hard scale of the roads, is a circumstance that fully explains why fractures are then more common than in summer.

The regular cause of fractures in ordinary birds is usually applied in falls, blows, etc. In this instance it is shown the bones were broken by the twisted action of the tendons attached to them. This is almost always the case with the fractured pectoris. The sternum and its ribs have likewise been broken by a violent contraction of the muscles inserted into them. This report is the best. With records 104 individuals, one of which was communicated to him by Forester, and by other men by himself in Malheur La. Presidio & Basadre, who met with the accident in seeking a guide place in the court of the Elbow de Suckow. When the injury happens in jumping, it often has a high curvature. Lewellyn shares a more probable than a portion of the os carpi is torn off by the pressure action of the flexion of the neck, than that it is broken by any blow immediately on the part. He shows that Dremal used frequently to his best complex of the bird, one of which is recorded in his *Clavis* (1847), under

Whether the long bones can be fractured by the mere action of the muscles is yet an unsettled point. In the Philosophical Transactions a fracture of the tibia is ascribed to this cause, and Robertson saw the same accident produced by striking a shankbone with a mallet. According to DeMezurier, it is a man's power, exceeding a labour at a quick rate, his bellows expanded in an expiratory, and his hands violently crossed to assist labour. The consequence was a fracture of the lower third of the leg. Cases inform us that a soldier, after receiving three considerable efforts from himself, then being thrown down by the falling of the ship. The larger vessel fractured by the perpendicular fall of the same vessel of the stage. The last had no fall, and, with some difficulty, supported himself in the other limb till he received assistance.

We are told, says Lottville, by Pease Donnelly, that a negro, about twelve or thirteen years old, was seized with violent spasmodic contractions of the muscles of the lower extremities, that the feet were turned backwards, and the neck of each thighbone was fractured, the ends of the broken bones protruding through the skin near the outside of the

high. A cure was effected after an embolism. We read also, in the *Effluviales Chirurges* about Mathias Chavennard, that during a fit of epilepsy, a child ten years old had its left humerus and tibia broken, and that, upon opening the body, other solutions of continuity were observed. Chavennard assisted in dressing a child, eleven or twelve years old, that had broken the tibia; it was then a considerable distance—*Lancet*, November 1870, p. 104, 208.]

Richardson, however, positively denies that a long time, when healing may even be broken by the mere contraction of the muscles.—(*Obstet. Jour.* 1. 7, p. 15, col. 4.)

For my own part, making all due allowance for the inconsistency of some of the reports made by writers, I think the possibility of the long bones being broken by the violent action of the muscles is sufficiently proved. I have never seen but one exception, but it was a very unusual one. I once attended, for the last Mr. Thompson, an exceedingly strong man, at Pontefract, who broke his *os humeri* in making a powerful blow, although he missed the aim and struck nothing at all. The whole limb was afterward affected with fast swelling and inflammation. This man, I remember, was also visited by Mr. Wellbank, of Clonsbury Lane. According to Nuss, the greatest number of fractures of long bones, by these muscular action, are produced by injury to the broken limbs; and in one of the cases published by this author, not only was this circumstance remarked, but an abscess and effusion of a portion of the fractured humerus ensued. In another instance reported by this gentleman, the clavicle in a state of generalized impurity broke down, was fractured in an effort to carry the arm far behind the back. After the rupture of the fracture, an abscess took place, and a piece of the bone extruded.—(*Lancet*, Nov. 1870, p. 404—406, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.)

3. Symptoms of Fractures.

A point of the symptoms of fractures are equalized; the pain and inability to move the limb, usually exaggerated, may arise from a mere bruise, a dislocation, or other cause. The crepitus, the separation and the equality of the ends of the fracture, when the bone is separated; the change in the type of the limb; and the shortening of it; are circumstances commanding the most certain information; and the crepitus, in particular, is the principal evidence to be depended upon, though occasionally attended on dislocation, and striking, as Sir Assise Cooper has explained, from a change in the quality of the synovial.—(*On Dislocations*, 4th, p. 6.) The signs of fractures, however, are so exceedingly various, according to the bones which are the subject of injury, that it cannot be said, that there is any one which is invariably present and characteristically confined to them. The variety of symptoms of injury, usually since loss of motion in the injured limb, deformity, swelling, tension, pain, heat, or loss, are the general symptoms of fractures. However, it is rarely demonstrable by any one separated with authority, that numerous fractures cannot precede the union of the part, nor occasion outward deformity, and every surgeon must know, that though at first there may be pain in the situation of a fracture, no swelling and tension take place till after a certain period.

When, therefore, a limb is broken, and the events are manifest from the distortion of the part, it is proper to draw near the fingers, the outline of the suspected injury. If it be the tibia, the surgeon examines with his fingers, whether any irregularity can be discovered along the anterior surface, and along the inner edge of that bone. If it be the clavicle, he then traces the muscular movement of the arm, in the same manner. When any unusual pain occurs, or any unusual irregularity appears, he then tries if a gentle or energetic, violent, or light, or undulating motion makes use of the suspected fracture, not against the other. When the ligaments are the subject of injury, it is of course, a positive sign, if the limb is touched; and, in the case of the broken thigh, there is a considerable shortening of the extremity, except in a few cases of fractures, completely transverse. But when there are two bones, as at the leg and the forearm, and only one is broken, the other continues to prevent the limb from being short-

ened and thrown out of its natural range, so that a crepitus can only be felt by a very careful examination with the fingers. The difficulty of the diagnosis is increased when the surgeon is consulted late, and great swelling has come on. "Where is the surgeon," says Bayle, "that has not sometimes hesitated to deliver an opinion in certain cases of this description?"—(*Threats of Med.*, Chap. 1. 3, p. 57.)

When the injured limb is shortened, the surgeon is thus presenting that such change proceeds from the passage of the fragments over each other, even he says that the bones are not displaced, and that the limb is not internally shorter than the other, or as consequence of a previous fracture that has been badly set.

In comparing the length of the lower extremities, one should place the joints in a horizontal position, and put the two external superior spaces of the toes straight in the same line; for, if these processes are not in a level, the limb towards which the joints incline, will seem longer than the opposite member.

The practitioner who is well acquainted with the anatomy of the limbs, and particularly with the mutual relations of the processes of the bones to each other, will readily perceive the alterations produced by a fracture. Whenever, in consequence of a fall or blow, a limb becomes convex at a part where it ought to be convex, or straight, or vice versa; the change of shape and direction must proceed from a fracture with displacement. The inner side of the great toe, when the leg rests on a horizontal surface, should correspond with the inner side of the knee-joint. If this natural relation be altered, if the inner side of the great toe be corresponded with the outer side of the knee-joint, there can be no doubt of the existence of a fracture of both bones of the leg.—(*Wright*, vol. 1, p. 3, p. 25.)

I am aware, that considerable harm and great unnecessary pain have been occasioned in the practice of surgery, by too much reliance to find the extent of fractured bones, and whenever the case is sufficiently evident to the eyes, the practitioner may give way to fluctuation at the expense of better to the advantage. There is no point in the case to be severely considered. A fracture is an injury necessarily attended with a great deal of pain, and followed by heat, is less swelling and inflammation; and to increase these evils by roughly or unconsciously handling the part is a great and cruel, and (if I may use the expression) monstrous, error.

In some kinds of fractures, the broken bone is so surrounded with thick fleshy parts, that it is difficult to find it complete, or ascertain the extent of the injury. Some fractures of the neck of the thigh-bone, surrounded with much extension of the limb, are cases illustrative of this observation. Whether Lazzarini's microscope will become practically useful as a means of elucidating the diagnosis, further trial will experience must determine. Lazzarini is said to have used it with success.—(*See British Med. and Surg. Journ.* No. 78, p. 577.)

4. Progress of Fractures.

The progress of fractures varies, according to the kind of bone injured, what part of it is broken, the direction of the branch of continuity, and what other muscular complications the case. Fractures of bones which have many strong muscles attached to them, are more difficult of cure than those of other bones which have not so many powers attached to them capable of distending the fragments.

A fracture of the middle part of a long bone is less dangerous than a similar injury near a joint. Fractures near joints are attended a false ankylosis. Thus, in a fracture of the thigh-bone near the condyles, the inflammation and swelling extend to the knee-joint, which is affected with a degree of stiffness that continues for a long while, and sometimes cannot be entirely cured during life. Moreover, the inflammation of the joint is attended with great severe symptoms, in consequence of the capsules having been more violent. In a fracture near an articulation, it is to be observed, also, that the ligaments have little concerned over the short fragment, so that it is often difficult to prevent displacement; and with respect to a transverse fracture of the neck of the thigh bone within the capsule ligament, whether an unpropitious position of the process of such a case by means of being matter is to be put back in any business in this country is to be

diagonal joint; and corroborating the statements in the publications of Messrs. Erich, Ambury, and Langstaff, I have still seen in the hand of Mr. Anney Cooper and numerous other surgeons of vast experience, recommending the possibility of a bony union in the permanent kind of osteitis here specified.

When a bone is fractured in several places, the case is more serious, and the difficulty of cure much augmented. But the accident is still worse when a limb is fractured in two different places at once; as, for instance, in the thigh and leg. Here it is almost impossible to reduce the fracture of the thigh, and maintain the reduction well, so as to preserve the natural length of the limb. (*Revue, Traité des Mal. Chir. t. 3, p. 23.*)

Dolipal fractures are more troublesome and difficult to cure than transverse ones, because an oblique surface does not resist the protrusion of the lower portion of the broken bone, and consequently it is very difficult to keep the ends of the fracture duly applied to each other.

Fractures combined with violent contusion of the soft parts, or with a wound rendering them compound, are much more dangerous than others free from such accidents. The best symptoms which render compound fractures in dangerous are many kinds: hemorrhage, violent and extensive inflammation of the limb, high circumscribed, or rising, and fever; large abscesses, disorganization, &c. Fractures of the leg are generally more dangerous than similar injuries of the upper extremities. The wound of a large artery may add considerably to the danger of a fracture.

It is demonstrated that such a fracture is less likely to heal well than that which is clean, or strong, or free from infection. In extreme old age, the view of a fracture is likewise more difficult and sometimes impossible. (*Revue, t. 3, p. 22.*) The severity certainly retards the formation of callus, and, as I have already noticed, even produces an absorption; but it is not true, that pregnancy always prevents the union of fractures. Some years ago, I attended, for Mr. Ransden, a sixty-seven years old man, of St. Paul's churchyard, who broke both bones of his leg when and was several months gone with child. Her pregnancy, however, did not appear to be at all unfavorable to the cure, as she got quite well in the usual time. "It is not generally settled," says a modern writer, "whether pregnancy should be considered a contraindication. I have, as well as some other practitioners, seen a pregnant woman get well of a simple fracture in the ordinary time." (*Journal, Nouvelle Doctrine Chir. t. 2, p. 130.*) And in another place he says, "Cesare Dignon et Faurice de Villiers, l'opérateur en grossesse, ont été les premiers à proposer, en cas de fracture, l'usage du bandage." (*Op. cit. t. 2, p. 178.*) The experience of Bland also tends to prove, that pregnancy is not unfavorable in the union of fractures. (*Revue, Traité des Mal. Chir. t. 3, p. 22.*)

The cases in which fractures have been admitted, will be considered in a future section of the present article.

5. Treatment of Fractures in general.

The general treatment of fractures embraces three principal indications: The first is to reduce the pieces of bone into their natural situation. The second is to secure and keep them in this state. And the third is to remove any subsequent symptoms likely to arise, and relieve them when they have arisen.

The first indication is only applicable in cases attended with displacement; for when the fragments are not out of their relative position, the surgeon must strictly restrict from all avoidable disturbance of the limb. His intervention should then be limited to putting to the fracture, resisting the necessity of any unfavorable symptoms, and removing them, if possible, after they have taken place.

1. Of the Reduction of Fractures.

The means employed for the reduction of fractures in general are chiefly three, viz. extension, counter-extension, and compression, or setting. But, as Boyer remarks, these means should vary according to the species of displacement; and surgical writers have prescribed too much in representing them all three as necessary for the reduction of every kind of fracture. In fact, there are several cases in which extension and counter-extension are perfectly useless; of this nature are fractures of the patella and clavicle, where the

displacement consists of a separation of the fragments. Here the reduction may be accomplished by putting the limb in a position in which the tendons attached to the upper part of the bone are relaxed, and then pushing the upper fragment into contact with the lower.

Extension signifies the act of pulling the broken part in a direction from the trunk, with the view of bringing the ends of the fracture into their natural situation. By counter-extension, surgeons imply the act of pushing extension in the opposite direction, in order to hinder the limb, or even the whole body, from being drawn along by the extending power, which would then be unavailing.

It was formerly recommended to apply the extending force to the lower fragment, and the counter-extension to the upper one. Such practice, indeed, was advised by Mr. Pott, and is still generally followed in this country; but upon his conduct it has been abandoned. The objections made to it by Boyer are, first, that it is frequently difficult, and sometimes impossible, to take hold of the two fragments, as, for example, when the neck of the thigh-bone is broken. Secondly, that by applying the extension and counter-extension to the broken bone itself, most of the particles which surround it are compressed, and such compression produces in them various a spontaneous contraction, which when relaxed, the extension and counter-extension cannot, and cannot even hinder. (*Traité des Mal. Chir. t. 3, p. 34.*) The French surgeons, therefore, apply the extending force to that part of the limb which is articulated with the lower fragment, and the counter-extension to that which is articulated with the upper. For instance, in a fracture of the leg, the extending force acts upon the foot, and the counter-extending upon the thigh; and in a fracture of the thigh, the extension is applied to the leg, while the counter-extending power acts on the pelvis.

One circumstance must here occur to the mind of the surgical reader. In this country, it is properly held, that one of the first principles to be attended to in the reduction of fractures, is to put the limb in such a position as will give the most powerful muscles connected with the broken bone; because these muscles principally impede the reduction, and furnish the ends of the fracture. But, in the French mode of treating the extension and counter-extension, how can the great principle be observed? If the extending and counter-extending muscles are not to be applied to the broken bone itself, but to others which are articulated with it, the first object of necessity is kept in a straight position at the time of reducing the fracture; for when the limb placed in a half-bent state, the extension and counter-extension, as practised by the continental surgeons, would not be in the same line. It therefore, is advantageous to hold the limb at the time of reducing a fracture, the French mode of performing extension and counter-extension must be relinquished. I am not, however, one of those surgeons who are vainly blinded with the idea of the possibility of raising the whole of the muscles connected with the broken bone, by merely bending the limb. On the contrary, I am perfectly convinced, with Desault, that in general, what is gained by the relaxation of some muscles, is lost by the tension of others. But when it is possible to relax, by a certain posture, the set of muscles most capable of preventing the reduction, and disturbing the coaptation of a fracture, that posture I would select. Thus, in a fracture of the leg, the strong muscles of the calf undoubtedly possess this power, and the best position, which relaxes them, appears to me, therefore, the most judicious and advantageous, not only during the reduction, but during the whole treatment of the case. A few years ago I had under my care, in the military hospital at Caen, a fracture of the tibia and fibula, which was at first treated in the straight position. The practitioner who seemed acquainted the fragments, and made them lie tolerably well. But every time the bandage was opened, the bone was always found displaced again. Finding that this circumstance went on for two or three weeks, we resolved to lay the limb on its outside, in the best position. At the head of the bandage was introduced a support to keep the fragments reduced. Indeed, therefore, the situation of a wound, abscess, or some particular disease, indicate an advantage or inconvenience from the straight posture, I always reduce a fracture by it in the best position, which will be hereafter described.

Here, therefore, I consider the French mode of making the extension and counter-extension as generally practicable.

I have also suggested an opinion, that the best position of the limb on its side, as advised by Mr. Pott, was the best for fractured thigh; but this sentiment has extensively appeared in our newspapers, and it gives me pleasure to have this opportunity of declaring my entire aversion to the principles and practice adopted in those papers by Dr. Smith and others, who are the advocates of counter-extending in order the extension were efficient. The considerations which have led me to this change will be related in speaking of fractured thigh. If, then, the surgeon persists in persisting in a mode of broken thigh, I think it will be universally believed, that the parts of the limb recommended by the French surgeons for the application of the extension and counter-extension are the most proper.

The ends and difficulties formerly encountered in setting fractured limbs, especially protruded, in a great measure, from the violent extension and counter-extension practiced by our ancestors. As they were ignorant of the utility of relaxing the muscles which displaced the ends of the broken bone, they had no means but the employment of great force to effect the reduction. Since, however, the excellent instructions contained in Mr. Pott's lecture on fractures have removed all the uncertainties in this, practitioners have generally been careful, in the reduction of fractures, to relax the muscles as much as possible by relaxing them, and thus the necessity for the employment of violent extension and counter-extension is effectually removed.

It will differ to say down, rules respecting the proper degree of force which should be used in making extension; for it must vary in different cases, according to the species of displacement and the nature and extent of the muscles concerned in producing it. In transverse fractures displaced outwards, in the direction of the bone, a very moderate extension suffices, as it is merely pointed with a view of loosening the muscles of the extremity of the fracture, which are always under at least some. For whatever be the direction of the fracture when the fragments pass over each other, the extension and counter-extension must constantly be such as to remove the shortening of the limb, and overcome the force of the muscles which, after all attention has been paid to their relaxation, still oppose the reduction. Extension, however, ought never to be practiced in a violent and sudden way; but in as gradual a manner as possible, the utmost care being taken not to shake, nor even move, the limb any more than can be avoided. When the practitioner extends a broken member all at once violently, he excites the muscles to strong spasmodic action, and there is some danger of lacerating them, because their fibres are not allowed the requisite time to yield to the force which elongates them. The extension is to begin in the direction of the lower fragment, and be continued in that which is natural to the body of the bone.

In every case of fracture with displacement, as soon as the necessary extension has been made, the surgeon is to endeavor to place the ends of the broken bone in their natural situation; this is termed coaptation, or setting. This operation is to be undertaken in different ways, according to the species of displacement, and the position of the ends almost always operates by acting upon the lower fragment, without applying his fingers directly to the broken itself, in order to diminish the contact of the extremities of the bone. Where, however, it is judged necessary for this purpose to touch the broken part itself, it should be done with the utmost gentleness, so as to avoid pressing the soft parts against the sharp and jagged ends.

Although the reduction of fractures may in general be accomplished with tolerable facility, a sometimes happens that the first attempts fail. This is occasionally attributable to the employment of too much force, and too little relaxation, in making the extension, whereby the tendons are injured, and act so powerfully, that the design of the surgeon is completely frustrated. Here the grand means of success is putting the limb into such a position as will relax the most powerful muscles which oppose the reduction. Sometimes, however, the difficulty and obstinate state of the fracture is not the effect of any wrong mode of pro-

ceeding on the part of the surgeon, but arises from the nature, position, and injury, caused by the accident itself. There remains the necessity of making it also the most likely method of removing the difficulty. In short, now that the utility of paying attention to this principle is generally known in the profession, a fracture is hardly ever met with which cannot be immediately relaxed; particularly if a copious bleeding be procured when the patient is a strong vascular subject. This, even when, indeed, will the power, for other reasons, highly beneficial, where the limb is much contracted and swollen, and the venous system is inflammation is great.

7. Of the Means for keeping Fractures relaxed.

After the bones have been put into their natural situation, there then would complete the reduction, were there not in the muscles a continual propensity to displace the ends of the fractured bone. In cases of fractures the muscles are often affected with involuntary spasmodic action, by which the broken part would constantly be disunited, were no measures taken to maintain the extension of the broken bone in contact. Besides, the joints, running through, coughing, sneezing, &c., might thereby subject the limb to a degree of motion by which the coaptation would be altogether destroyed. Hence the necessity of employing means for fixing the broken limb so firmly that it may remain perfectly immovable during the whole time requisite for the union of the fracture. This second indication is sometimes troublesome and difficult, and, as before observed, it is in this part of the treatment that the surgeon has some opportunity of evincing his skill. The means employed for the attainment of this indication are, an advantageous position, splints, bandages, aprons, and various kinds of apparatus.

In the treatment of all fractures, the position of the part, and indeed of the whole body, is a thing of national importance. Whenever the case is well understood, the lower extremities, the patient should be strictly fixed into the radius is completely relaxed. This is an advantage but in the lower bed much more than a yard wide, because the surgeon and assistants can then more conveniently get at any part of the limb. Feather-beds are a great deal too soft and yielding; a horsehair mattress is far preferable. Better, indeed, is an improved with the utility of setting the patient lies upon a surface which will not sink, that he recommends two mattresses to be used, and a board to be laid under the upper one from the hip to beyond the patient's foot.—(Traité des Joints, Chap. p. 22, and 23.)

The most favorable position for a fractured limb is that in which all the muscles passing over the fracture, and extending either to the lower fragment or to that part of the limb which is articulated with it, are equally relaxed. The injured limb should also have firm support at every point, and its position ought to be regulated so that not only that object be perfectly fulfilled, but so the same that the nature of the displacement from the action of the muscles, or the weight of the body, or part itself, may be diminished as much as possible.

The manner as to the most easy position of the limb is that which is usually chosen by a person who posess himself or who is sleeping; for then all nature is extended, and every part becomes that position which is most congenial to it. In this position, the limbs are not extended, nor yet entirely bent; but only to a moderate state of flexion. Hence, Borel remarks, that a half-bent position of the limb is that which is most natural, and that in which all the muscles enjoy an equal degree of relaxation, and, consequently, that it is, generally speaking, the best for fractures. This position which was recommended by Hippocrates and Galen, has been lately revived by Pott, who appears to have comprehended its advantages. Considered in a general way, it is without comparison preferable to every other position of the limb; but its employment should be liable to exception, as will be related in treating of particular fractures.—(See Borel, Traité des Joints, Chap. 8, p. 46.)

In whatever position a broken limb is placed (says Sir William), it should bear throughout its whole length equally and independently upon the surface on which it lies, and not be only partially supported. When, for example, only the extremities of a fractured limb rest upon the bed, the weight of the limb itself will exert a force in the direction of the fracture. The

link will also be rendered crooked, if the broken part be supported, while the extrusion of the link especially, the inferior end, seems by their own weight. The displacement of the fracture is not the only inconvenience arising from the limb being laid upon a surface while it is not every where equally supported. The parts which do bear on this surface experience a painful degree of pressure, which, if long continued, is apt to produce inflammation, and even sloughing, of the adjacent parts. Thus, the pressure of the leg, pressure of the foot that sometimes arises entirely from this cause. Such inconveniences may be prevented by laying a fractured limb on a surface which is depressed there; that is to say, on a surface which is depressed where the limb has projections and rises where it presents depressions. The surface should not be so hard as to injury the patient, yet it ought to be sufficiently firm as to yield to the weight of the limb and appearance. According to Boyer, the best surface for the support of broken limbs are stuffed with clean of straw, a substance which he describes as far preferable to feathers, because it more readily yields of being raised from the place where the limb is placed to another situation where the limb presents a depression or hollow; and it has the advantages of being less heating than feathers and less apt to rot.

If whatever position fractured limbs are placed, they ought to be kept perfectly quiet during the whole time requisite for the union. If the broken bone be moved while the callus is forming the surfaces of the fracture rub against each other, and the progress is retarded; and, indeed, sometimes by repeatedly moving the limbs, the consolidation of the limbs is wholly prevented, or, at least, retarded very slow and difficult.

In order to maintain the limb in the right position, and in a state of quietude, and to preserve the fragments in proper contact with respect to each other, the surgeon is to choose the patient to avoid moving at all more than can be helped, and every carefully to subject the limb to any kind of shock or vibration is to be removed. But in particular, it will be necessary to apply a restrictive apparatus, usually consisting of some application to the skin such, bandages, splints, tapes, straps, and bandlets, &c. (see *See Boyer, Traité des Mal. Chir. t. 3, p. 12*.)

Upon the choice of the bandages, bandlets, &c. which ought to be applied to fractures, no surgeon has written better than Mr. Pott.

"The intention (expressed in applying any kind of external medicine to a broken limb is, or ought to be, to remove inflammation, to disperse extruded blood, to keep the skin dry, moist, and perspirable, and on the same time to afford some, though a very small, degree of restraint or confinement to the fracture, but not to that of pain; and it should also be increased as much as possible in general swelling, as large effusion, or in any disposition to effusion. At St. Bartholomew's Hospital, we use a corset made by a mixture of oil, sugar, and vinegar, which, with soap, and wax, is an excellent dressing for such cases, as it just to afford being spread without warming."

This is very easy, repeat inflammation, is not violent, passes off soon, and very seldom, if ever, increases, or causes either heaves or erysipelas. Before the time and composition of the application made to the limb be what it may, one thing is clear, viz. that it should be put on in such manner, as that it may be removed and added as often as may be necessary, without moving the limb in any manner: it being necessary that when once a broken thigh or the leg has properly set in right, and has been supported properly on the pillow, it ought not ever to be lifted up or moved from its position without necessity, until the fracture is perfectly healed; and it is best that such necessity will not very often occur."

Such application having been made as the surgeon may think fit, the next thing to be done is to put on proper bandages. That formerly used was what is commonly called a cast. This was of different kinds, according to the appearance, shape, or use it was made in the form of any two or three pieces.

By such kind of bandage three intentions are served at, and must to be accomplished, viz. to confine the fracture, to remove or prevent a flux of aneurism, and to regulate the cavity (see *Boisvieux*); but without any other regard to the matter. It will soon be perceived, that although some were of

bandage is necessary in every simple fracture, as well for preserving some degree of situation to the limb, as for the motion of the apparatus, yet some kind of either of these three ends can be answered singly, or even principally, by bandage of any kind, whether cast, otherwise, if this should be found to be true, that is, if it should appear, that whenever kind of situation be made use of, it cannot be a principle, but may be necessary kind of situation, and that is a small degree, and very little to be depended upon. It will follow that such kind of bandage as is most common to be applied with justice and exactitude, such as is most common and out of order, such as would most frequently in need of removal, and in such removal is most likely to give pain and trouble, than to cause any degree and less danger than one which is more easily applied, less likely to be out of order, and which can be removed without moving the limb, &c.

The best and most useful bandage for a simple fracture of the leg or thigh is what is commonly known by the name of the eighteen-band bandage, or rather, one made on the same principle, but with a little difference in the disposition of the pieces. The intention wanted is to make it so that the parts which are to surround the limb make a tight sling with that which transverse the limb; instead of which, if they are tied on so as to make an acute angle, they will fall over each other in an oblique direction, and thereby all power mostly and necessarily, as the parts will thereby have more contact with, and more independence to, shift every. In compound fractures, as they are called, every body will not acknowledge the safety of this kind of bandage, probably in the night, and for very obvious and convincing reasons, but possibly because it does not become necessary to lay up and disturb the limb every time it is dressed, as they have the bandage loose.

The joint attending motion in a compound fracture, the circumstance of the wound, and the extent of degree of swelling of parts thereby produced, are certainly very good reasons for dressing such cases with a bandage which does not render motion necessary; but I should be glad to know what you mean a necessary, or right, or slight, or more a limb in case of simple fracture? what matter can be proposed by it? what injury can be done from it? When a broken bone has been well set, and the limb well placed, what possible advantage can arise from tying it? Surely none; but, on the contrary, pain and possible mischief. Is it not the case that one might be the same instance? Can tying the limb every two or three days continue to such advantage? must it not, on the contrary, obstruct and retard it? Is not perfect quietude an necessary towards the union of the bone in a simple as in a compound fracture? Justice then in the case there is a wound which requires to be dressed, and the motion of the limb may be desired to be avoided with rather more pain than in the other; but does this then in the simple fracture give rise to phenomenon experienced in it?

Every benefit then which can be supposed to be obtained from the use of the common bandage is to be, is equally obtainable from the use of this which I have just mentioned; with one addition, and to the patient still inestimable advantage, viz. that of being able to get to country to have his leg or thigh set, during the cure, removed from the place on which it has been previously depended. (*See Pott's Elements on Fractures, &c.*)

In France a universal preference is given to this kind of bandage in every instance where we suppose the eighteen-band cast, from which it clearly differs in being composed of separate pieces, admitting of removal, so that when a part of the bandage is found to be taken away without changing the whole of the dressings. These pieces are first attached to the limb which are most to be removed, and then they are drawn up to the part. In cases of compound fractures where the bandage is soiled with the discharge it is a very short time, and must be often removed. Certainly Bandage's bandage is the best, particularly as it prevents all the inconveniences common to that of the eighteen-band kind. (*See Boyer, Traité des Mal. Chir. t. 3, p. 18*.)

With respect to the general objects and uses of bandages in cases of fractures, ought to serve two kinds of them, which is strongly indicated in the French sentence; namely, one of "bandaging the fr-

tability of the muscles" by the compression, resulting from their regular and even, suppling to the whole of the member. In describing the treatment of particular fractures, I would like to mention to direct to the examples in which a moderate general compression of the muscles may be attended with utility.

"The parts of the general apparatus for a simple fracture, which come just in order (according to Mr. Pott), are the splints;" which are unquestionably the most efficient of all the appliances made to a broken limb with a view of keeping the ends of the fracture steady and in a proper state of contact. Without these the surgeon would in vain endeavor to treat the reduction.

"Splints," says Pott, "are generally made of paste-board, wood, or some pointing kind of stuff, and are ordered to be applied longitudinally to the broken limb; in some cases, times, in others four; for the better steady and quiet situation of the fracture."

But splints properly made and judiciously applied are very serviceable as beyond all doubt; but their utility depends much on their size and the manner in which they are applied.

The true and proper use of splints is to preserve steadiness in the whole limb without compressing the fracture at all. By this means they become very necessary to use as a curative intention; by this means, they are very capable of drawing pain and other morbid humors at the same time that they support, in the nature of things, contribute to the steadiness of the limb.

In order to be of any service at all, splints should, in the case of a broken leg, reach above the knee and below the ankle; should be only two in number, and should be so guarded with wool, rag, or cotton, that they should press only on the joints, and not at all on the fracture.

By this they become really serviceable; but a splint which extends only a little above and a little below the fracture, and does not take in the two joints, is nearly useless; and, what is worse, it is attended with obscurity.

By pressing on both joints, they keep not only down the two ends, but, by pressing on the muscles, they exercise retain it in its place, so that the fact is, in smaller degree displayed (but they vary, and frequently the discussion thereof, by really pressing the parts covering the fracture against the edges and irregularities of it).

In the case of a fractured os femoris if the limb be laid in an extended position, the splint should certainly reach from the hip to the outer ankle, and another (superior) splint should extend from the groin to the inner ankle. In the case of a broken tibia and fibula, there never can be occasion for more than two splints, one of which should extend from above the knee to below the ankle on one side, and the other splint should do the same on the other side." (See *Remarks on Fractures and Dislocations*, in *Pott's Chirurgical Works*, vol. I. p. 256, 4th. edit. 1809.)

Another very singular discovery of the employment of all tight bandages, and of covering the whole of a broken limb with splints. He was called to a gentleman of rank at Paris, who had broken the knee-joint. He laid the limb upon a coarse splint, the shape of which was adapted to the undersurface of a part of the leg and thigh. No bandage was used; merely two leather straps, which crossed upon the knee, and sustained the fractured bone. "A perfect bony union was thus easily effected. A small afterward extended the use of a coarse splint, applied under the limb, to the middle of the leg and thigh. In the first of these cases, however, only the thigh is removed to the better splint, and from this two branches, or lateral splints, go along the leg. The operation has also a kind of work for the support of the foot. As this simple contrivance is fastened with a very fine muslin, and the pressure on bandages are laid, the surgeon has constantly a view of the whole bone of the limb, and of the fracture part of it, which Amiel thinks a great advantage. In compound fractures, he puts no other dressings on the wound but loose compresses, which are kept continually wet with rose water." (*Mémoires de Chirurgical, Paris, 1806*, 1812.) For further observations on the making, see *Amiel*.

In oblique fractures of the thigh, and sometimes even in those of the leg, the difficulty of accomplishing by the ordinary means a rare this has frequently, and especially without a knowledge of the limb, has led to the idea of employing external extension. This operation implies the operation of a bandage, or fascium, which continually draws the fragments of the

broken bone in contrary directions, at the same time that it retains them from giving over each other, and maintains them in contact during the whole time necessary for their union. In England this practice has long been relinquished. It appears to have been chased away by the leading theory of relaxing every muscle in such tumors as is made it incapable of supporting an oblique fracture; a theory with which the surgeons of this country were but too much misled by the persuasive eloquence of the late Mr. Pott. Doubtless, and, once, however, every indiscretion in the doctrine of the possibility of relaxing the muscles, so as to incapacitate entirely the whole set connected with a broken thigh; and he never ceased to insist on its absurdity; that in such a case the assistance of a mechanical apparatus applied to the limb was the main thing, by which the obliquity of the limb was to be prevented. When we consider the treatment of fractured thighs, we shall find that the principle of continual but moderate extension, has had to Pott's advantage of great extent and influence, though it is a method to which many surgeons in this country appear to entertain strong but highly exaggerated objections.

By means of constant extension (observes Everard), we can very effectually in making the fracture, while the limb preserves its natural length, but we affect the part a dislocation, which is singularly favorable to the treatment of the cancer.

In order to derive from constant extension the utmost benefit, and render the method as little painful as possible, and applicable during the whole term of treatment, the apparatus and bandages, according to Boyer, should be constructed and applied conformably to the following rules.

It should avoid compressing the muscles which pass over the situation of the fracture, and the compression of the whole of the muscles of the limb, which is done by the guiding of the fragments over each other.

With this view, the extending power ought to be applied to that part of the limb which is situated with the lower end of the fractured bone; and the counter-extending force to that which is situated with the upper limb. If these forces were applied to the broken bone itself, the muscles passing over the fracture would suffer such compression as would excite spasm, and render the extension imperfect and even harmful.

The extending and counter-extending force ought to be divided upon as large surface as possible.

The result of this rule is obvious. The pressure of external bodies on parts is less painful, in proportion as the surface pressed upon is extensive, and the operation supported at several numerous points. On this principle a narrow band crosses at right angles and more painful pressure than a broad one; and hence, the rollers and other pieces of the apparatus for making the extension and counter-extension should be as wide as possible.

The power making continual extension should act according to the direction of the axis of the broken bone.

The constant extension should be graduated in its action, gradual, and increasing as a manner as possible.

The machine easily yield is a force which stretches them, when such bodies are applied, and is very gradually increased, according to the motion of the limb, and the power of the muscles producing the displacement. But if not when it is a sudden it begins with making violent extension, the rapid forcible elongation of the muscles would excite such a spasmodic action of them as would frustrate every attempt to restore the natural length of the limb. And if, in order to fulfil this purpose, the extending force were increased in a ratio to the resistance of the muscles, there would be danger of fracturing these organs, because their fibres would not have time enough to yield.

Lastly, the parts upon which the extending and counter-extending force must be applied, and the compression made by the figure, or other pieces of the bandage and apparatus, ought to be equalized.

These indications may be fulfilled by, covering the parts on which the legs and bandages press with one or wool pads; and by filling up all the depressions of the limb with the same soft substances, so as to give it a circular form. The bandages will then rest on the most projecting parts, on which they would make a strong and unequal degree of pressure, if the depressions were not artificially filled up.

By observing these rules, says Boyer, external extension may always be effected, even by the most delicate and inflexible patients; and the important advantage will be obtained of saving the fractures with the proper length of the limb preserved.—(*Traité des Mal. Chir.* t. 2, p. 56, 57.)

F. Means for preventing and removing the unfavourable symptoms liable to arise from Fractures.

After having reduced the fracture, applied a suitable apparatus for maintaining the reduction, and put the part in an advantageous position, the practitioner is to attend to the third indication in the treatment, viz. the prevention and removal of any unfavourable symptoms.

With the exception of a few simple fractures of the upper extremity, it is proper in all cases to allow for the first few days only, very low diet, broths, &c., &c. When the patient is young and strong, and the swelling and inflammation are likely to be considerable, no-nutrition should be prohibited. In other circumstances it may in general be dispensed with, because it is well known, that for the quick formation of callus, starvation is to be avoided, strength and a supple circulation are highly desirable. The patient may be permitted to drink not often and as much as he likes, of any cooling and beverage. A very low diet is only to be continued the first few days, unless great inflammation arise; for experience proves that the method, when too much prolonged, has bad effects, and tends, in the same principle as fasting, to retard the union of the fracture.

Conspicuous is to be avoided by the use of opium and other narcotic medicines. It must be observed, that in fractures of the lower extremity, the disturbance of the limb caused by the patient's being obliged to move himself, after making a paralytic, is seriously objectionable; but perhaps in all, and certainly in some cases, it is useful to open the bowels soon after the accident would have small and pernicious consequences. In order, however, to lessen the difficulty, a cathartic should be carefully introduced under the patient. Here, also, I feel it my duty to recommend to the notice of the profession a very complete fracture-bed, invented by my friend Mr. Earle. One great advantage of this bed, far more of which is moderate, is to enable the patient to read his book, without the slightest change of position or disturbance; an object effected by the simple contrivance of a little kind of trap, covering under the bed, out of which a small portion of the mattress admits of being withdrawn, and a bed is complete is placed for the reception of what is folded from the bowels and bladder. Some great advantages of this apparatus will be hereafter briefly mentioned.

With respect to external applications, we should carefully avoid using all such plasters and cataplasms as irritate the skin or create a disagreeable itching; for they sometimes bring on erysipelas. The simplest aqueous compresses are the best for all simple fractures; and it is the best rather because it does no harm, than because it does any essential good. It is, generally speaking, a good plan for the first few days to wet the dressing with cold water. In this way, the swelling is diminished and swelling may be considerably lessened. The surface, however, should be soiled that the patient should be wet, and may become so much as to do harm if not attended to. No fatigue of the sort of cold water with, make bread-cakes stiff and hard; and as they are perhaps not so efficacious as cold water alone, the latter is sometimes preferred.

When a fracture is well set, the position of the part right, and the bandage well adapted, nothing too tight nor too slack, the less the broken bone is moved, and the less the apparatus and dressings are disturbed the better. Accordingly, however, the practitioner is obliged to take off the splints, and redo the bandage, in order to ascertain that the ends of the fracture do not even extend. We are to turn the splints on the joint two days, or a fortnight, without making any of the important point, be neglected. When the time for alteration, that the fracture was in a state of disorganization, and the limb seriously diseased. Hence, a wrong notion for employing the splint-stuffed bandage, which tends to bring about without disturbing the limb, or even without taking it from the surface upon which it lies, has been proposed.

In fractures of the lower extremities, particularly of

the leg, it sometimes happens the first pain or three nights after the reduction, that the limb is found to be convulsive against the straps, which makes the patient start in his sleep, and displace the ends of the bone, which tend to again reduce.

When the callus has acquired some extent, the patient should still keep the joint or limb quiet, and the union is perfectly consolidated. And in fractures of the lower extremity, even after the union has proceeded so far that the splints which of being left on the patient ought not to venture to get out of bed, or rest upon the limb, till several more days have elapsed.

All fractures, however simple and well treated they may be, are constantly followed by inflammation and swelling of the limb. These unpleasant consequences on the ground, the more violently the limb has been moved, the sooner the fracture is in a joint, and the longer the part has remained motionless and without exercise. The inflammation always affects the interior part of the broken bone much more than the exterior. For the relief of these effects of fractures, it is customary to employ friction, fomentations, vesicating applications, cold washes, and bathing; but sometimes, notwithstanding such remedies, the inflammation does not quickly recover its strength, but remains still and weak for a year, or even a longer time. The most effectual plan for the prevention of this state should therefore be resorted to early. These consist in making the joints rest, the more exact night exercise, as soon as the union is sufficiently advanced not to be in danger of interruption from this position. A great deal of exercise, however, is necessary in making the joint, and it is only by the support to superintend the business itself, that have it to the patient or others. One of the best means for the relief of fracture, weakness and swelling in the limb after a fracture is, to discontinue the splint and tight bandages immediately the state of the callus will allow. The exercise in which the patient is to be made the circulation, and prevent the return of the swelling, is one of the principal causes of the return of the limb; and, consequently, the sooner the patient is set off the sooner will the patient again be free of the limb.

In Fracture, the chief division of fractures is in simple and compound; which last includes many many varieties, the cases which we have mentioned. We shall here briefly notice a few of the complications, and the particular treatment which they require.

Fractures (says Boyer) are always attended with a certain degree of contusion, which is constantly more severe in cases where the violence has acted directly on the situation of the fracture. But such contusion can only be regarded as a complication of the wound, when it exists in so violent a degree as to demand a different treatment from that which is employed in simple fractures.

In this circumstance, the splints and bandage should be applied rather loosely, and the joint ought to be wet with cold water, or some medicinal lotion. The patient is to be bed, more or less freely, according to the state of the constitution, and violence of the contusion. The next day, the splints and bandage should be changed, a thing highly necessary as is observed, for where it has been attended, the limb has been known to mortify, in consequence of the swelling being rendered the bandage too tight.—(Boyer, *Traité des Mal. Chir.* t. 2, p. 52, 53.)

It cases where the contusion is severe, but notwithstanding a wound of the integuments, the wound and swelling may be so intense, that the union is retarded, forming abscesses filled with yellowish matter. These abscesses may derive an interperitoneal suppuration, and tend to imagine that the limb is threatened, or actually affected with gangrene. They ought to be punctured, and covered with plasters of simple emulsion. After some practitioners apply emulsion punctured under the apparatus; but there is a better reason in their use, and perhaps cold lotions are possibly better.

In simple fractures, it does not often happen that a large artery is wounded, but when the injury does occur, and a diffused hæmorrhage takes place, the reason is to expose the vessel by an incision, and apply a ligature above and below the opening. We are to be careful, however, before making the incision, that the patient is not in a violent inflammation, which we

almost always be completed by resident application.

Fractures are sometimes complicated with a dislocation. Here, if possible, the fracture should invariably be reduced before the fracture is set. The possibility of reducing the dislocation (says Boyer), depends upon the species of articulation, the situation of the fracture, and other circumstances of the case. When it is a diaphyseal joint, when the ligaments are lacerated, and the swelling is not considerable, the fracture may be reduced easily enough; but when it is an articular joint, surrounded by numerous muscles; and when the fracture is near the articulation, and situated below the condyles, the reduction of the latter is impossible. The attempt, indeed, would be injurious, because the necessary extension could not act upon the upper fragment; and were it to operate upon the latter, it could only have the effect of possibly stretching the muscles, and perhaps lacerating them. The fracture, therefore, should be at first attended to, and after its firm union, an endeavour may be made to rectify the dislocation. Rarely, however, that there will be some probability of success, when care is taken to move the limb gently, as soon as the state of the callus will permit. He also recommends the employment of constant trituration apparatus. His conclusion, however, that the attempts rarely succeed after the perfect union of the fracture. These are, it is true, examples in which the dislocation may be reduced; but there are cases which are not complicated with a fracture; an accident which always renders the muscles and ligaments so stiff, that they cannot yield at this emergency required for the reduction. "I do not know (says Boyer) that a fracture, complicated with dislocation, has ever been reduced, when the nature of the joint and the various genera of the case prevented the treatment from beginning with the reduction of the dislocation."—(Threats de Med. Chir. t. X, p. 76.)

CONTRAINDICATIONS.

What Mr. Pott has said upon these cases is, with one or two exceptions to which I shall advert, the essence of good surgery, and is the least deteriorated, as a few other parts of his principles have been, by the more mature instructions of time and experience, or by the growing state of surgical science, which, devoted to practice and observation, is continually bringing to light new facts.

In a compound fracture says Mr. Pott, the first object of consideration is, whether the preservation of the fractured limb can, with safety to the patient's life, be attempted; or, in other words, whether the probable chance of destruction, from the wound and circumstances of the accident, is not greater than it would be from the operation of amputation. Many things may serve to make this the case. The bone or bones being broken into many different pieces, and that there is considerable swelling, as happens from lacerated vessels, or other heavy bodies of large surface, passing over or lying on the limb; the skin, muscles, tendons, &c. being so torn, lacerated, and destroyed, as to render extensive amputations the most probable and most extensive means; the extremities of the bone forming a point being crushed, or, as it were, comminuted, and the fragments, meeting each bone lying long and equal, are, as Mr. Pott says, sufficient reasons for proposing and performing immediate amputation.

Mr. Pott admits that apparently desperate cases are sometimes cured, yet that he is so qualified and warranted as to render amputation the only possible means for the preservation of life, we have said this before. This was an uncontroverted fact, but a fact which proves very little against the common opinion, because every case of stupor, also known that what others are very rare, make the rule almost of being made prevalent.

5. This recommendation relative to amputation is of the more importance, because it is most frequently applied to the lower extremities; every instance of delay, in its many instances, in the patient's suffering; and a very short space of time, indeed, frequently makes all the difference between prompt safety and death. If these cases are proved, would admit of deliberation for two or three days, and during that time such circumstances might be expected to arise as might necessitate to determine the propriety of the amputation without delay to the patient's interest, this difference would be

considerable; the former would not seem to be so prejudicial in his determination as he is frequently thought to be; and the latter, being more distressed of the necessity, would submit to it with less reluctance. But, principally for both parties, that it settles the case; and the high expediency having been ascertained, at the moment, the whole decision of a man's judgment is required, that he may neither hastily and unnecessarily deprive his patient of a limb, nor through a false tenderness and timidity suffer him to perish by undeviating to preserve such limb.

The limb being thought capable of recovery, the next consideration is the reduction of the fracture.

"If the bone be not fractured both, the trouble of reducing and of placing the fracture in a good position, will be much less than if the case be otherwise; and in the view of procuring, or throwing both of the bone or bones, the difficulty is always in proportion to the compressive size of the wound through which each bone has passed. In a compound fracture of the leg or thigh, it is always the upper part of the broken bone which is thrust forth. If the fracture be of the femur, the head and the neck large, a moderate degree of extension will in general easily reduce it; but if the fracture be simple, and immovable, as it often does, in a long, sharp point, this point very often makes its way through a wound no longer than just to permit such extension. In this case, the very pushing the leg in a straight position, in order to make extension, drives the neck or spine in and the bone forth, and makes all that part of it which is out of such wound press hard on the skin of the leg underneath it. In these circumstances, all attempts for reduction in this manner will be found to be unproductive; the more the leg is stretched out, the deeper the bone will be buried in the wound, and the more it will press on the skin underneath.

Upon this occasion, it is not very unusual to have necrosis to the skin, and by that means to remove it portions of the protruded bone.

I will not say that this is a way of ultimately mischievous or wrong, but it is more so than is frequently so. In some few instances, and in the case of extreme sharp-pointedness of the extremity of the bone, it may be, and undoubtedly is right.—(See Pott's Obs. on Med. Chir. Trans. vol. 12.) This is every instance it is really necessary.

The two next proper means of considering this difficulty are, change of position of the limb, and enlargement of the wound. In many cases, the former of these, with proper conduct, will be found fully sufficient; and, when it fails, the latter should always be made use of. Whenever we attend to the effect which putting the leg or thigh straight, a compound fracture and protruded bone into a straight position always produces, that is, in the manner in which the wound in such position finds the bone, and in the increased difficulty of reduction thereby increased, and with this, by extending the position of such limb from an extended state to one moderately bent, observe the attention thereby directed both the joint-muscles and tendons, will be satisfied of the truth of what I have said; and of the much greater degree of ease and possibility of reducing in the bent than in the extended position, that is, in the method that is the effect of the state of the case."—(Boisacq, *Principes de la chirurgie*, either by extension or change of position, Mr. Pott recommends an enlargement of the wound.)

"If the bone be broken into several pieces, and any of them be either badly separated, so as to be loose at the wound, or if they be so lacerated and distorted as to render their union highly impossible, all such pieces ought to be taken away; but they should be removed with all possible precaution, without pain, violence, or laceration, without the risk of hemorrhage, and without the risk of the blood being so lost as to be fatal. If the extremities of the bone be broken into sharp points, which pain much and irritate the surrounding parts, they must be removed also."—(See Pott's Obs. vol. 12.) For the whole of this part of the treatment of a compound fracture should be conducted with great caution; and the practitioners should remember that if the parts surrounding the fracture be violated, that it is, in fact, increased, and so directed as to impede the union of the bone, and it is chiefly the same thing as to the patient, and in the case of the arm, the shoulder.

violence be the necessary consequence of the fracture or of the transitory and awkward manner of picking up and disturbing the wound. The great objects of fear and apprehension in a compound fracture (that is, in the first or early stage of it) are, pain, irritation, and inflammation; those are to be avoided, prevented, and allayed by all possible means, in every thing else be as it may; and although certain things are always related as necessary to be done, such as removal of fragments of bone, of foreign bodies, &c. &c. &c., yet it is always to be understood that such acts may be performed without producing as great violence, and without adding at all to the risk, or least necessary incurred by the disease.

Reduction of or setting a compound fracture is the same as in the simple; that is, the reduction in both is to be done, viz. by means of a greater degree of extension to show as yet a position at the ends of the fracture with regard to each other, as the nature of the case will admit, and thereby to produce as perfect and as easy union as possible.

To maintain this place what has already been explained the flesh of the wound, would be tedious and unnecessary. If the arguments there used for making extension, with the hand so moderately bent as to relax the muscles and take off their power of resistance, necessary here in all, they necessarily reach even when applied to the present case; if it is allowed to be feared very much to extend, be it to put it to the test of the simple fracture which are set at all or not slightly extended, and only made in such extension to be picked and irritated, it is considered that it must be much worse when the same parts are torn and separated. After a few additional observations in praise of the good effects of relaxing the muscles, Mr. Pott proceeds:

"The wound, when (if necessary) some pieces removed (if there were any), and the fracture reduced to the best possible position, the next thing to be done is to dress it decently."

When Mr. Pott wrote on this subject, the plan of bringing the edges of the wound together with adhesive plaster, in cases of compound fracture, had not been established; and the advantage of this mode of dressing in the first instance was not fully known. It does not mean the practice of drawing the edges of the wound firmly together with strips of plaster, nor of concealing and compressing the part with the same; but only the method of applying two or three short pieces of plaster, so as lightly and gently to retain the opposite sides of the wound in contact, and afford them an opportunity of uniting by their own force. Now, although such attempts will frequently fail, on account of the wound being generally in a confused, irregular, and inflamed state, the chance of success should be taken, because the experiment in all cases will do no harm, and if it succeed, it will change the case at once, from a fracture with an open wound, to one which has no external communication, or at least almost healed, from a compound into a simple fracture. Some of the following directions, therefore, given by Mr. Pott, I consider in the present state of surgery as only applicable when the wound has healed.

The dressing necessary in a compound fracture, is of two kinds, viz. one for the wound, and that for the limb. By the former, we mean to maintain a proper opening for the way in which the discharge of blood, lymph, matter, excrement, &c. &c. is to be made, and by the latter to support the limb, and by such means, as shall give the most possible pain or fatigue shall enable it to be in a quiet, but open by the part by, not by any means contribute to its cure, or to the discharge of what must be discharged. By the latter we are, should be the prevention of removal of inflammation, in order, if it does not end in all other circumstances, particularly, that the wound may be healed by what we term, and the first intention, that is without suppuration or abscess, without not being prevented by that suppuration and inflammation, or from very large suppuration may be prevented, and which a moderate and steady degree of extension is the best way for the purpose of a cure. The first, therefore, for the dressing for the wound, can consist of nothing better, or indeed as good, as soft dry lint, laid on so lightly as just to support the sides, but neither to draw the wound, nor to the wound and suppuration or inflammation to the discharge of matter. That lint should be kept clear of the edges, and the whole of it should be covered with a piece

spread with a soft watery digest. The dress of dressing must be determined by the state of the wound, if the discharge be small or moderate, more in the first few hours will be sufficient; but if it is large, more frequent dressing will be necessary, so as to prevent, or at least to remove the inflammation arising from a great discharge of an irritating sharp matter.

When, from neglect, some length of time passed without attention, from some cause or accident, as the patient, from awkwardness and inattention in dress, or from any other cause, a tumour has taken possession of the limb, and it is become most painful and painful, Mr. Pott advises, that a warm plaster is the most proper application that can be made, moderate touch is impossible, and every thing which can tend towards relaxing the state, and to cause an easy state of the parts concerned, must necessarily be right. But when the parts are not in this state the intention seems to be very different. To relax the parts, and to remove pain and irritation by some relaxing, cooling, &c. &c. to prevent inflammatory distension, and immediately in every part; and the ought to be done at by very different means. In the former, a large suppuration is a necessary consequence of relief, and the great means of relief in the latter is to cool, and in very moderate degree of it all that is required. The warm-plaster, therefore, although in the best application that can be made use of in the one case is certainly not so proper in the other, as application of a more constant kind, such as mixture of spirit, wine, vinegar and water, with the addition of sweet oil, hyacinthine, acetic acid, sugar plant, ammonia, and medicines of this class, in moderation, the regimen may succeed. By these, in great degree to moderate the inflammation, and with the assistance of what should never be neglected (I mean abstraction) and the general antiphlogistic regimen, inflammation may sometimes be kept off, and a very successful, without any suppuration or discharge of matter."

"Compound fractures in general require to be dressed every day; and the wounded parts are always in the greatest degree of motion without great pain, and quite healthy because no necessary or dangerous dressing."

The common bandage, therefore (the roller) but always of this new broad kind, and which is used the eighteen-lined bandage substituted very judiciously in its place.

Signs of proper length, which reach from one joint, or compound of them both, and are applied on both sides of the limb, are very useful both in the shape and in the compound fracture, as they may, that is, be made to keep the limb from constantly moving and quiet then it can be kept without these."

Mr. Pott then enters into the consideration of the position of the limb, which is so principal a circumstance, that without the concurrence every other will be useless. The points to be aimed at are, the even position of the broken parts of the bone, and such position of the muscles surrounding them, as is most suitable to their wounded, lacerated state, as that is best likely to unite them, by keeping them in the state of it is broken, high inflammation, and at best large suppuration."

According to Mr. Pott, these cases, of all others, are at first the most right observation of the inflammation; just as to be approach, and not to be treated by incision; inflammation is to be prevented by bleeding and aperient medicines. And before the first state or stage, the treatment of the limb must be continued, neither for the purpose of inflammatory treatment by incision, or such as, even and sudden having already taken possession of the limb, were favourable, and relaxing and cooling medicines are required.

"If, then, according to the particular expression of the case, prove successful, the consequence is either a cure only wound, which either begins in the first intention or suppurates very moderately, and goes little or no trouble, or a wound attended at first with moderate inflammation, and then producing large suppuration, with great discharge and inflammation, formation and suppuration of matter, &c. as the other kind of

"The property of having recourse to remission will depend upon the age, season, and general habit of the patient. In the young, robust, and plethoric, the practice is, on every supposition, judicious."

attends do not, second, the suppuration is gangrenous and mortification.

These are the three general results of termination of a compound fracture, and according to these must the surgeon's conduct be regulated.

In the first instance, he has indeed nothing to do but to avoid doing mischief, either by too violent a dressing, or by disturbing the limb. Nature, left alone, will accomplish its own purpose; and art has little more to do than to preserve the free position of the limb, and to take care that the dressing applied to the wound gives no impediment.

In the second stage, that of suppuration and induration of matter, in consequence of large suppuration, all a surgeon's judgment will sometimes be required in the treatment both of the patient and his injured limb. Discharge of the wound, or the mere removal of the dressing, or the removal of fragments of bone, or the introduction of bone, will very frequently be found necessary, and must be resorted to. In the doing this, care must be taken that what is requisite be done, and no more; and that each requisite operation be performed with as little disturbance and pain as possible.

Precious to large suppuration, or considerable collections and indurations of matter, evacuation by phlebotomy, an open limb, and amputations, considered, as well as the free use of anodynes, and such applications to the limb as may assist in the progress of suppuration, are the remedies which Mr. Pott advises for the relief of the swelling, inflammation, and high inflammation, attended with pain, stiffness, and fever. "But the means having been tried, and let out, and the pain, fever, &c., which were symptomatic thereof, having disappeared or ceased, the usual purpose of such measures and such applications cease also, and they cease therefore to be indicated. By evacuation, and the patient's strength has necessarily (and indeed properly) been reduced; by amputation, &c. the parts have been so relaxed as to prevent any contraction or reunion of the soft parts, a substance of foundation, and the establishment of a free suppuration; but these ends were fully and fully answered, another indication arises, which regards the safety and well-being of the patient, namely, if not fully, as much as the former, which intention will be necessarily frustrated by pursuing the method hitherto adopted. The patient now will require support and support as much as he before stood in need of reduction; and the limb, whose internal and external state hitherto required the support and raising position, will now be left by each kind of operation, and would need of such as are equal and contrary qualities, or in some such as shall not violate its state. Good, light, easy supported support, and the Peruvian bark, will best answer the purpose of anodynes, the dissection of the cataplasms, and the application of medicines to the surrounding parts, are no necessary with regard to external."

"Every body who is acquainted with surgery knows (says Mr. Pott) that, in the case of bad compound fractures, attended with large suppuration, it sometimes happens, even under the best and most judicious treatment, that the discharge becomes too great for the patient to sustain; and that, after all the attempts, past and present, which he has adopted, it becomes neces-

sary to amputate the limb by the loss of the limb." This, I say, does sometimes happen under the best and most rational treatment; but I am convinced that it also is now and then the consequence of pursuing the reducing, the suppuration, and the raising plan too far. I would therefore take the liberty seriously to advise the young practitioner to attend diligently to his patient's pulse and general state, as well as to that of his fractured limb and wound; and when he finds all these complaints at an end, and all inflammatory matter and hardness gone, and his patient either languid and prostrated, that his pulse is rather weak and low than hard and full, that his appetite begins to fail, and that he is inclined to vomit at night without assignable cause, and that is consequence of a large discharge of matter from a limb which has suffered great inflammation, but which is now become rather soft and flabby than hard and rigid; that he will in such circumstances be about the support of his patient, and the strengthening of the diseased limb, &c. &c. &c. in which I am from experience, enabled to say often be successful, whereas it may not be generally expected, that he would. Alas! he will have the satisfaction of having made a rational attempt; and if he is obliged at last to have recourse to amputation, he will perceive it, and his patient will submit to it, with less reluctance than if he with trial had been made."

According to Mr. Pott, suppuration and mortification are sometimes the desirable consequences of the treatment done to the limb at the time that the bone is broken; or they are the consequences of the liberation, or pain, made by the mere protrusion of the dead bone. They are also sometimes the effect of improper or negligent treatment; of great violence used in making extensions; of irritation of the exposed parts, by holding off, or in dressing fractures in splinters of bone, or of painful dressings; of improper disposition of the limb, and of the neglect of phlebotomy, anodynes, &c. &c.

"When such accident as such disease is the more consequence of the injury done to the limb, either at the time of or by the fracture, it generally makes its appearance very early; in which case also the prognosis is generally too rapid for us to check. For these reasons, when the mischief seems to be of such nature that gangrene and mortification are most likely to ensue, no time can be spared, and the impending mischief must either be prevented, or prevented by early amputation. I have already said, that a very few hours make all the difference between probable safety and destruction. If we wait till the disease has taken possession of the limb, even in the smallest degree, the operation will serve no purpose, but that of accelerating the patient's death. If we wait for an apparent abatement in the part, we shall have wasted time all opportunity of being really serviceable is past. The disease takes possession of the cellular membrane surrounding the large blood-vessels and nerves some time before it makes any appearance in the integuments, and will always be found to extend much higher in the survey part than its appearance in the latter seems to indicate. I have mentioned once or twice the experienced mark of suppuration, often a gangrene has been known, that I never saw it cured; it has always been found the patient's destruction."

As far, however, as my experience will enable me to judge, or as I may from thence be permitted to dissent, I think where that mark appears, should never be made, but the first opportunity having been neglected, or not sustained, all the power of the therapy

"After the bones had tested, Mr. Pott never found it necessary to amputate a limb for a compound fracture, on account of the bad green discharges."

In the article *Gonorrhea* I observed, however, the reader well that there is a species of gangrene, arising from external violence, and totally unconnected with constitutional causes, where the surgeon should devote from the common rule of deferring amputation until the mortification has ceased to spread. A treatise on *Suppurative Processes*, which was published a few years ago by Baron Larrey, contains the most decisive facts in regard to the propriety of such practice.

—(See also *Mr. de Cley's Memoirs* &c.) The experience of Mr. Lawrence seems also to confirm the truth of Larrey's observations. —(See *Med. Clin. Trans.* vol. 8, p. 164, &c.)

"It is a positive evil, says, from a liability in using a knife, to make use of knives and pliers convenient for the discharge of large matter. Where matter or a discharging sinus immediately and safely to make, it is always preferable, the surgeon sometimes among themselves agree to the operation with which it is applied, and maintaining as the judgment by consulting the matter; however, which, it requires a greater degree of power to make it efficient than a limb in such circumstances generally can bear."

"It is surprising how large and very dangerous a discharge will be made to a considerable length of time, in some instances, from the efforts and irritation of a splinter of bone. It therefore such discharge be made, and there be neither signs nor judgment to account for it, and all other circumstances are favorable, sometimes about always be made in order to know whether such cases does not exist, and if it does it must be gently and carefully treated."

viability of the bones is more active; these vascular granules, their pulsation substance there abundant. On the contrary is advanced age, the parts have lost all disposition to develop the vascularity of the bones is in a great measure obliterated, and (as the expression of Boyer) their vitality is annihilated after the union of fragments of bone which avulsion is them.

It has been assumed, that in early infancy the callus is generally produced in excess, and may sometimes be its impediment. His experience does not confirm the truth of this statement. The real cause of delivery always proceeds from the fact, either being badly set, or not kept properly reduced, or vice from the part being pushed about before the union has acquired a due degree of firmness.

2. *Classification.* A fracture is united again sooner in a strong healthy person, than a weak unhealthy subject. Sometimes, the consolidation is prevented, by some hereditary unknown cause, nothing wrong being perceptible either in the constitution or the part. Hirsch and Van Keulen met with several cases of this kind, in which the patients were apparently quite healthy and laboriously trained; and there are few examples of such experience who are not acquainted with similar examples.

3. *Thickness of the Bone, and Weight which it has to support.* The bones are thicker and larger, in proportion as they have a greater weight to bear, and as the muscles inserted into them are more powerful. It is observed, natives purchase, that the larger the bones are the longer is the time requisite for their union. Thus a broken thigh-bone is longer in growing together again than a fractured shin; the shin longer than the humerus, the bones of the forearm, clavicle, ribs, &c.

As the callus remains a good while softer than the rest of the bone, it follows, that if the newly united bone has to bear all the weight of the body in walking, the patient should bear this extreme longer. Hence one reason why fractures of the arm are sooner cured than those of the thigh, and why six or seven weeks at least are necessary in the treatment of a broken thigh-bone, which of itself has to support in proportion all the weight of the trunk.

4. *State of Health.* Fractures heal with more quickness and facility when the patient enjoys good health. The system has a more and powerful effect in restoring the consolidation of fractures, and even in causing an absorption of the callus several years after its formation, so that a bone becomes flexible again at the point where it was formerly broken. As Lord Apsley's fracture the phenomenon is particularly marked.—(See p. 112, 113, 15, in this.) Lamachus is acquainted with several cases, in which the callus at the end of eight weeks became again soft and the bone flexible, as consequence of the patients being attacked with gonorrhea or syphilis.—(See p. 113, 1, 2, 3, 4.) Cannon, has venerea, and syphilis are also stated by several writers to obstruct, and sometimes hinder altogether, the formation of callus.

Falkner has cited two cases, which tend to prove that the union of fractures is retarded by pregnancy.—(See p. 113, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.) Another has also cited a case in which the union, which had been delayed during pregnancy, took place after delivery.—(See p. 113, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.) And (see p. 113, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.) Another has published an account of a fracture of the radius in a pregnant woman, where the cure was apparently retarded for a long time by this circumstance, but through the timely care of the patient to deliver, the callus was not very firm till after that event.—(See p. 113, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.) From the facts, however, mentioned in a preceding page of this article, there can be no doubt that pregnancy frequently does not prevent the formation of callus in the ordinary case, though the observation of Mr. Wesley is true, that many instances have been observed of bones being fractured during pregnancy, and never showing any disposition to unite till after delivery.—(See p. 113, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.)

Whether the present trade here and is a genuine pair, as the owner presenting the name of fractures, a few additional observations to the same nation will be introduced in the sequel of this article, when we have of the nature of the various degrees of all the

2. Of some local Circumstances necessary for the Consolidation of Fractures.

As Boyer has well explained, three local circumstances are necessary to obtain a firm union without adhesions. 1. The two fragments must be possessed of sufficient vascularity. 2. The surfaces of the fracture must correspond. 3. They must be kept in a satisfactory unobscured state.

The two fragments must be sufficiently vascular. If one of them should be too much supplied with blood, the fracture would be incapable of union. This, as is asserted by Boyer, though denied by Albrecht and others, is what happens in certain fractures of the neck of the femur, where the head of this bone is extremely detached, and the ligamentous substance which is attached over its neck, and serves as its periosteum, is totally lacerated, as well as the vessels which run along it. Hence, the upper fragment lodged in the osseous cavity no longer receives from the vessels sent to it through the ligamentum femoris a sufficiency of blood for the purpose of the formation of callus. This is especially likely to be the case when the patient is the advanced in years, and the vessels considerably lessened in number. An adequate circulation must therefore exist in both portions of bone; or without it the attempt at union will fail.

The surfaces of the fracture must correspond exactly. This circumstance is not absolutely necessary for the consolidation of the fracture; but without it the formation of the callus is always slow and difficult. For instance, in a transverse fracture of the thigh-bone, the fragments, after being displaced according to the thickness of the bone, may undergo a second displacement according to its length, by passing beyond each other. The surfaces of the fracture are then set in all in contact, and the portions of bone only touch each other by their sides, which, being covered by the periosteum, can unite with difficulty. Here, at the end of the second month, the union will frequently have made but little progress; we can the cure be accomplished without difficulty and shortening of the limb.

The fragments must be retained in a completely immovable state. This condition is so essential to the formation of callus, that if the ends of a fracture were daily moved, they could not unite. The two extremities of the bone would then heal separately, just like the ends of a wound which have not been put in contact. The ends of a fracture, however, which unite frequently become according to Boyer's always become smooth, and in three ordinary any capillary ligament formed.—(See p. 113, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.)

3. Different Opinions as to the Formation of Callus.

As Boyer remarks, perhaps no subject has excited more discussion than the formation of callus. The opinions mentioned in the introduction of a physician that which was called the osseous mass, and which, becoming hard, served to unite the ends of the broken bone, just as glue serves to unite two pieces of wood. Hence, in order to favour the production of callus, they were in the habit of accumulating their patients in an atmosphere of every sort of stercoraceous aliment, the glutinous parts of animals, and especially of mussels, at which Falkner's patients refuse to eat.

But if these accounts were true, callus must be inorganic, or else one would be compelled to admit, that the organization of an inorganic fluid was capable of producing an organized substance; which is an absurdity. Besides, observation demonstrates that callus is an organized matter, like the substance of the bone itself, which it resembles, and that when subjected to anatomical and chemical experiments, it exhibits all the appearances of the proper substance of bones.

According to Haller, callus is formed by the part system, which he regards as the origin of ossification. When a bone is fractured (says this naturalist), the periosteum of the two fragments first grows together, and then unite, and form a cartilage rising round the fracture. The thickened periosteum is converted into a gelatinous substance, which soon becomes a cartilaginous matter. In the vessels of the periosteum, and different points of ossification commence, which finally unite. Then, when every part of the periosteum near the fracture is hardened and united, the matter is changed, as it were, into a sort of clay, which spreads over the two fragments, and binds them together.

separated ends are necessarily in mutually parallel, I can conceive it possible (says Mr. Lawson), and, in fact, have frequently been seen to be connected with the soft parts; but this was the presence of a granular matter which had still retained its vitality, and which, instead of forming a contribution to the general action, grew powerfully, not only in the periphery, but also in the removal of bone, have been long allowed to the periphery. No one, I will venture to say, has as yet noticed this membrane in either of these cases. Now bone has not been found adhering to the periosteum, either in fractures of morrons; far less have complete substance composed of the ossified periosteum been ever developed enclosing a neoplasm. In every instance the new formation is deposited in nodules adhering loosely to the soft bone, with an irregular, above, freely perforated by capillary arteries. The vessels of the bone, in short, are ramified on the external and internal periosteum; but it is only after their entrance into the periosteum, that they become disposed to join and ossify matter."—(Edin. Med. and Surg. Journ. Vol. 76, p. 67.)

From experiments continued by Brocher and Williams, it would appear that the union of broken bones is not exclusively owing to the effusion of a particular fluid which coagulates and gradually changes into an osseous substance; nor to the contraction of the myofibrils and oblique periosteum; nor, in the majority of instances, to granulations produced from the surfaces of the fracture; but it is frequently dependent upon all these circumstances together, or at least several of them; and, in every case, it is the result of a series of changes, observable in the soft parts immediately adjoining the fracture, in the periosteum, in the medullary sheath, in the cartilage and very texture of the bones themselves, and in the substance intervening between the two fragments. As simple fractures, the following are stated to be the principal circumstances resulting during the process.

1. Effusion and coagulation of a small quantity of blood between the ends of the fracture, which blood escapes from torn or ruptured vessels.

2. A fluid, at first of a thick quality, effused and accreted, as it were, between the periosteum and the bone, and thence exuding from the surfaces of the fracture and the soft parts.

3. A gradual increase in the quantity and consistency of the preceding substance, changed together, forming every day a stronger and stronger connection between the parts; then their change is a red osseous substance between the fragments, and between the bone and the periosteum to a substance which is at first soft, but in the end acquires the characters of bone.

4. At the fractured part, a reunion of the periosteum and soft parts, which are equally contracted and adhered together, with the intermediate substance between the fragments.

5. A distention, and then an obliteration of the medullary cavity, at first by a cartilaginous, and then a bony deposition.

6. Successive modification of the whole of the enveloping composing the callus, and of the substance between the fragments, preceded by a fibrine and cartilaginous state.

7. The return of the soft parts around the fracture, and their fit of the periosteum, to their natural state.

8. After the union of the surface of the fracture, the medullary cavity and texture are gradually re-established, and the swelling formed by the callus always diminishes.

First, in compound fractures, besides these circumstances, the production of granulations from the surfaces of the bone is also to be taken into the account.—(See Edin. Med. and Surg. Journ. Vol. 58.) This difference from what happens in the process of union of simple fractures is also particularly noticed by Mr. Wilson.

"From the joint being exposed in a compound fracture, the first bond of union, viz. the coagulable lymph of the blood, is removed or destroyed; hence it can become vascular. Inflammation is consequent on the injury done to the periosteum, and when the parts are healthy, granulations arise. These granulations from the broken extremities of the bone soon assume the osseous appearance, and when they come in contact with each other, union."—(On the Structure, Diseases of the Bones, &c. p. 223, 2nd Lond. 1820.) It is curious that, in broken cartilages, we

never see a mass of bone; a circumstance which has often been noticed in respect to the ossification of the ribs.

Whatever may be the process by which union is formed, it is during the first two or three weeks after the fracture that the fragments undergo the changes which produce their reunion. But it is between the twentieth and thirtieth, and especially between the thirtieth and fortieth days that nature labours most actively in consolidating the callus. Hence, in this period, care must be taken the ends of the fracture in contact and perfectly at rest, should be maintained; for, though there are a few instances in which deformity really proceeds from irregular consolidation, it is a fact, that the deformity almost always originates from the fracture being disturbed and not kept properly reduced.—(Reper. Trans. du Med. Chir. L. 2, p. 84, &c.)

1. Of the Contact to be adopted in the ordinary Period of the Consolidation of Fractures, and of the Treatment of Joint Injuries.

When the requisite time for a broken bone to become firmly united has elapsed, it is proper to examine carefully and carefully the place of the fracture, in order to learn whether the union has acquired a suitable degree of strength. If the bone should be found to be in the best of the injured parts, the callus is not sufficiently strong, and the limb should be immediately put up in the apparatus again, with a view of preventing a new fracture, or, at all events, deformity.

For the same reason, the patient should not be allowed to make much use of his limb, so soon as the fracture has united. In fractures of the lower extremity, he ought to use crutches, and only let the weight of the limb be borne by the upper part of the injured limb. Then, as the strength of the callus has been known to be completed, the limb is to be straightened, and the patient becomes a cripple. An accidental slip may also produce the fracture again; for, notwithstanding the insertion of wires, the callus is far from being stronger than the rest of the bone, it is still considerably weaker.—(Reper. L. 2, p. 94.)

If, when the necessary time for the completion of the union has elapsed, the callus is not yet firm, we must examine, let the relative position of the fragments and the consistency of the callus, &c. The cases which may have retarded its consolidation.

That the state of the constitution has considerable influence over the process by which broken bones are restored, is unquestionable. Schneider found the formation of callus, even in the most simple fractures, sometimes delayed eight months, and in one instance more than a year; but the patients were all of them remarkably healthy.—(Vermischte Chir. Schriften, p. 1, p. 28.)

There are certain indelible constitutions, in which bones, more particularly, however, the os humeri, will not unite again after being broken. These temperaments are also very various; at least I infer so from two subjects to whom I paid particular attention. One was a strong, robust man, whose chief peculiarity seemed to be his indifference to pain: the ends of his broken humerus were cut down too, lashed out, and saved off, by Mr. Long, in St. Bartholomew's Hospital, and the limb was afterwards put in splints and taken the greatest care of; but no union followed. The other case was a broken tibia and fibula, which remained divided for about four months; but afterwards joined together. The latter subject was a complete instance of hypochondriasis. I afterwards saw a woman, under Mr. James Esdaile, in the above hospital, whose os tibiae did not unite in the least, though it had been broken several months. Every attempt to move the bone occasioned excruciating torture. The woman died of some illness in the hospital, and on dissecting the arm, the cause of the fracture not having united was found to arise from the lower, sharp, pointed extremity of the lower portion of the broken bone having been forcibly driven up by the accident, and protruding the substance of the tibia, in which it still remained. I was indebted to Mr. Esdaile for the description of the appearance in the dissection, and I do not know this kind of impediment to the union of a fracture has been noticed by any other writer than Mr. Charles White, who appears to have ascertained the possibility of the occurrence.—(Lancet in Surgery, p. 76, vol. 1776.)

The causes of fractures remaining divided will

The foregoing treatment, however, is only likely to answer before a new point, in all events, a ligamentous division occasioning is completely healed, and when the limb has attained its former position.

When the case is old, and there are grounds for believing that a permanent union of the ligamentous connection has taken place, we are advised to cut down to the ends of the bone, strip of saw them off, and then treat the limb just as if the case were a recent compound fracture.

This last practice was first suggested by Mr. C. White. "Robert Elliot, of Bolton, in Lancashire, a very beautiful boy, nine years old, had his right arm, about midway in the year 1780, by a fall from the ladder, torn the middle of the bone. He was immediately taken to a bone-setter in that neighbourhood, who applied 3 bandages and splints to the arm, and treated him as properly," says Mr. White, "as I suppose he was capable of, for two or three months. His situation, however, went by as means productive of the desired effect, the bone not being at all united. A surgeon of eminence in Manchester was afterwards called in; but as he was found to be of no service to him, and as the case was very curious, he advised the lady's friends to send him to the Infirmary at Manchester. He was accordingly brought thither six Christmas following, and admitted an in-patient. Upon examination, we found it to be a simple oblique fracture, and that the ends of the bone were not only at: his arm was become not only entirely motionless, but even adhered to him, and was likely to be otherwise as there was little probability that it could ever unite, it being now six months since the accident happened."

Amputation was therefore proposed as the only method of relief; but I could not give my consent to it, as the boy was young, and had a good constitution, it was hardly possible that it could be owing to any fault in the nature of fluids, but that either nature was disappointed in her work, by frequent motion while the callus was forming, or rather, that the fibres ends of the bone, being strong, and divided a part of a muscle, and some portion of it had probably lacerated itself between the two ends of the bone, preventing their union. Whichever of these might be the case, I was of opinion," continues Mr. White, "that it might be relieved by the following operation: viz. by making a longitudinal incision down to the bone, by bringing out one of the ends of it, which might be done with great ease, as the arm was flexible, and cutting it off either by the saw or cutting pliers; then by bringing out the other, and cutting off that likewise, and afterwards by replacing down end to end, and treating the whole as a compound fracture."

The objections made by the other gentlemen concerned to this proposal were, first, the danger of wounding the humeral artery by the blade. Secondly, the laceration of the artery by bringing forth the ends of the bone. And, thirdly, that we had no authority for such an operation. As to the first, that was easily obviated, by making the incision on the side of the arm opposite to the humeral artery. The place of incision appeared to me to be at the external and lower edge of the deltoid muscle, as the fracture was very near to the insertion of that muscle into the humerus; the danger of wounding the vessel not only being by that means avoided, but also the operation, while the patient was confined to his bed, the matter could be prevented from lodging, and the wound be easily come at, to remove the dressings. The second objection will not appear to be very great, when we consider that in compound fractures the bone is frequently thrust through with great violence through the integuments, and seldom attended with laceration of any considerable artery; and as this would be done with great caution, that danger would appear very trifling. The third and last objection is in every thing a groundless one.

This method which I have been proposing," says Mr. White, "was at first conceived upon, and I assisted in the operation, which was performed by a practitioner of great abilities in his profession, on January 31, in the present year (1790). The patient did not lose above a spoonful of blood in the operation, though the dissection was not made so deep. When the operation was finished, the limb was placed in a fracture-box, covered on purpose, the lid confined to his bed, and the rest of the treatment was being different from that of a compound fracture."

The wound was nearly healed in a fortnight's time, when an erysipelas came on, and spread itself all over the arm, attended with some degree of swelling; this, by dressings and the antiseptic method soon went off, and the cure proceeded happily, without any other interruption. In about six weeks after the operation the callus began to form, and is now quite firm. The arm is as long as the other, but somewhat smaller, in consequence of such long-continued bandages; he daily regains strength in it, and will soon be fit to be discharged."—(Case in Surgery, p. 58, &c.)

In another instance of a broken arm, which continued divided an extraordinary length of time, Mr. White performed an operation somewhat similar to the foregoing one, with complete success. He made a longitudinal incision, about four inches in length, through the integuments which covered the fracture. By the application of a trephine, he cut off the upper end of the bone, and so the lower end could not so easily move off; he continued himself with scraping it. In the course of the subsequent treatment he had occasion to take off, under the cutting pliers, a small angle of tibia, and to touch the lower part of the bone with the hammer of anatomy, so that he was able to introduce the same vessels between the extremities of the fracture, in order to destroy a substance which intervened. A trifling inflammation followed. In twelve weeks the bone was firmly united."—(Op. cit. p. 81, &c.)

Respecting Mr. White's cases, there are now some other instances upon record, where the operation which he first proposed has succeeded. In the year 1812 Langenscheidt operated upon a humerus in the foregoing manner, and the result was perfectly successful. The united fracture was situated at the insertion of the deltoid."—(New Med. J. 1, p. 105.) Mr. Rowlands, of Chester, by a similar operation, cured a fractured thigh, which had, till all disposition to unite."—(See Med. Clin. Trans. vol. 2, p. 47.) Vigani, surgeon to the Hotel Dieu, at Toulouse, has also practiced Mr. White's operation with success."—(See Leroy, Mem. de Chir. Militaire, t. 2, p. 124.)

On the other hand, the operation has frequently failed. In the instance in which I have just mentioned the humerus by Mr. Leve, in St. Bartholomew's Hospital, it did not answer, though the ends of the bone were most firmly sawed off, and the case treated with particular care and skill. Boyer states that he once performed the same operation in a similar case; but that it had not the desired effect."—(Traité des Mal. Chir. t. 3, p. 180.) Dr. Physick, of New-York, when he was a student in 1785, saw this proceeding successfully adopted in a case where the humerus remained divided."—(See Medical Repository, vol. 1, New-York, 1804.) Besides these examples, I have heard of others, in which Mr. Elliot, Mr. Green (Med. Clin. Review, Feb. 1826), and Lord. Med. Gazette p. 237), and other practitioners, have tried the experiment with no better success. What is still more degrading, the operation has sometimes proved fatal."—(Richardson, New-York, Clin. J. 2, p. 24, of 2. Leroy, Mem. de Chir. Militaire, t. 2, p. 124.)

The difficulties, the danger, and the frequent ill success of the foregoing operation, rendered another mode of treatment extremely desirable, when Dr. Physick, of New-York, suggested the plan of introducing a wire through the potential joint, with a view of exciting inflammation, and bringing about a union of the bone. This suggestion promises to be a considerable improvement in modern surgery. In Physick had an opportunity of performing the new operation on the 15th of October, 1805, in an example of divided humerus, twenty months after the occurrence of the accident. Before making the incision above Dr. Physick, I desired the assistants to make some extension of the arm, in order that the wire might be introduced, as much as possible, between the ends of the bone. Some ligament a plectrum was applied to the surface made by the wire, and secured by a roller. The patient suffered very little pain from the operation. After a few days the inflammation (which was not greater than what is commonly excited by a similar operation) through the first of my other part) was succeeded by a moderate suppuration. The arm was now again extended, and again applied. The dressings were renewed daily for twelve weeks, during which time no amendment was perceived; but soon afterwards the bending of the arm at the fracture was observed, and it became very rigid.

been, and the patient complained of much more pain than usual, whenever an attempt was made to hold it at this place. From this time the formation of the new bony union went on equally, and on the 4th of May, 1852, was so perfectly completed, that the patient could move his arm in all directions as well as before the accident happened. The wound was now cured, and the small scars occasioned by it healed up entirely in a few days. On the 29th of May, 1852, he was discharged from the hospital perfectly well, and he has since repeatedly told me his arm is as strong as ever it was." (*Phy. Med. Rep.*, vol. 1, New York.) In the *London Medical Repository* for Aug. 1852, a case is also noticed, in which Dr. Fyfe cured an ununited fracture of the lower jaw by means of a pin.

On this subject an interesting memoir was read by Larrey to the Ecole de Médecine at Paris (*Gazette Méd.*, 1811). It was entitled, "Dissertation sur la non-union de quelques fractures, et en particulier de celles du bras, et sur les moyens nouveaux de guérir les fractures articulaires qui en résultent." The author of this problem admits, that when he was at Ayrberg, he saw Baron Percy, then with the army of the Rhine, pass a wire through the imperfectly healed centre of a compound fracture of the thigh, which fracture seemed to have lost all disposition to unite. The method answered so well, that in two months the patient was able to walk without crutches.

Mr. Hodge has also successfully employed the pin in a case of ununited broken thigh. The patient was a boy about 15. (*New Med. Lib. Trans.*, vol. 5, p. 267, &c.) In this country the same operation has been performed for the cure of a disunited humerus by Mr. Stenfield, of Leeds. (*See op. cit.* vol. 7, p. 108, &c.) It appears, also, that Mr. Charles Bell applied the method to a fracture of the leg, at the time when it was in England. The patient was a child six years old, and the broken bones had continued without union three years. Thomas had been originally mistaken by other skillful surgeons for a mere contusion. Here, however, whether the operation succeeded or not. (*Phil. Med. Lib. Trans.*, vol. 4, p. 185.)

We must not forget, however, that Dr. Fyfe's new operation will succeed in every instance. Like most other surgical means, it is liable to occasional failure, among which, I believe, we may include the strong union on a detached thigh by Mr. Wardrop (*New Med. Lib. Trans.*, vol. 8, p. 265), though a partial union only is mentioned. In a case recorded by Mr. Anstey, the wound did not cure. Mr. Hinchman was also obliged to take out the screw because of irritated hæmorrhoids, and go home without it. (*New Practical Obs.*, p. 162.) Three instances of failure were seen by Mr. Anstey (*Obs. Fracturae*, p. 254), and an additional one has been recorded by Mr. Kain. (*New Med. Lib. Trans.*, vol. 15, p. 185.)

In the same case, and also in another which I now under this gentleman's care, the plan of cutting down to the ends of the fracture, and rubbing them with creosote potash was tried, but without success.

Instead of several of the foregoing wires and often uncomfortable pins, Mr. Anstey has tried, with much encouragement, the influence of local pressure and rest. He maintains the ends of the fracture closely pressed together, the process, when the fracture is transverse, operating longitudinally; and when oblique, transversely. A short sling, pads, and a particular apparatus are used accordingly. (*Obs. Fracturae*, p. 226.) Mr. Dechamps, of Huel, has related two cases, in which a union of the fracture followed a powerlessness in the application of fracture of bone. (*On Fractures*, p. 75.)

[This brings to its ingenuity and skill of our countryman, Dr. Fyfe, is without doubt well merited, for the use of the seton in cases of artificial joint has found adherents in almost every country, and been attended with great utility and success. In particular failure, however, has led to the trial of local pressure by Mr. Anstey; and in the *London Med. and Phys. Journal* for 1852, Mr. Hodge has reported an instance of the success of this practice, after the failure of the seton. Dr. Thos. H. Wright, of Baltimore, and Dr. Wilson, of Philadelphia, have each reported successful cases of Mr. Anstey's treatment of ununited fractures, and promises to go on to give the place of the seton in this country among surgical generally. Dr. Wright's case may be found in the *Ann. Journal of the Med. Society* for 1852.—*Edin.*]

FRACTURES OF THE ORAL BONE.

These bones, from their situation, are much exposed to fracture. The fragments are sometimes not damaged; but most frequently they are depressed. In order to replace them the surgeon must pass a bone elevator, a ring-headed screw, or any such instrument into the cavity, and using it as a lever, push the fragments upwards; while, with the index finger of the left hand, he prevents them from being pushed too far. When the fragments are depressed in all directions again, some authors advise inserting them with an elastic pin outside, so that, introduced into the cavity, but I am inclined to believe, with Mr. F. H., no pin can be employed so as to support the broken bones; and when these have been replaced, they will not readily change their position, as they are acted upon by no muscles. (*New Operative Surgery*, &c., p. 229.)

Besides, as Deland remarks, since the teeth sustain much the fragments, they cannot support them, and they must be secured with all the instruments of surgery, bodies placed in contact with parts already damaged, or about to become so. (*Précis des Méd. Lib.*, &c., p. 302.)

As fractures of the lower jaw are the result of falls, and direct blows on the face, the soft parts are always either very much contused or wounded.

Fractures of the lower jaw are sometimes attended with very dangerous symptoms; depending either on the compression of the brain, produced by the same blow which causes the fracture, or on the soft parts being pushed into the cavity of the mouth, or on the fragments being driven into the brain, so as to injure and compress the brain. This last danger, however, some modern surgeons consider as not of frequency; and whatever the symptoms are, as a solution of the brain, the nature of the case is referred to the intimate connection between the bones of the jaw and the os frontis. (*Phy. Med. Lib. Trans.*, vol. 4, p. 185, &c., p. 186.)

When there are symptoms of pressure on the brain (*see Med. Lib. Trans.*), and the time has been lost, depressed, the surgeon must immediately raise them, and endeavor to disengage gradually the perpendicular process of the os maxillare, which is connected with the external maxilla and os frontis. Perhaps a pair of curved canines, or a pair of curved forceps, introduced into each nostril, might facilitate the surgeon to do what is necessary. Bleeding, and the antiphlogistic treatment are always proper; for the vicinity of the eye renders it liable to become inflamed; and when there are symptoms of pressure of the brain, emaciation, &c., the necessity of such practice is still more strongly indicated.

FRACTURES OF THE LOWER JAW.

This bone is sometimes fractured near the chin; but seldom so as to produce a division of the symphysis; the fracture is generally happening between this part and the insertion of the masseter. In other instances the fracture occurs near the angle of the jaw, that is to say, between the insertion of the masseter and the root of the coronoid process. The last may also be broken in two places at the same time; in which case the patient's position is extremely difficult to keep right, because many of the muscles which draw the lower jaw downwards are attached to that part.

The cricoid and os hyoid are sometimes broken; the former the most frequently.

Fractures of the lower jaw may be either perpendicular to the base, oblique, or longitudinal: of the latter, examples have been known, even in a portion of the alveolar process, with the teeth in it, was detached from the rest of the bone.

The soft parts are generally contused and wounded. J. L. Petit mentions one case in which the bone was broken, and the coronoid process quite detached, by the kick of a horse.

Fractures of the lower jaw are seldom in displacement in the following way. When the fracture is at the symphysis, the side on which the process maxillaris is situated is drawn downwards and backwards by the sub-maxillary muscles, while the other fragment is supported by the muscles which close the jaw. When the fracture is more backwards, no displacement occurs in the same way, but one or more of the teeth are fractured in two pieces, the middle portion is always pulled downwards and backwards by the muscles attached to the chin, while the two

lateral pieces are kept up by the levator subulae. When the ramus of the jaw is broken, the masseter, being attached to both pieces, prevents any considerable degree of displacement. When the neck of the condyle is fractured, the pterygoid muscles may pull the condyle forwards.

When a blow is received on the lower jaw, or the bone is injured by a fall, or by the pressure of some heavy body; when an arrow-point is embedded in the part, and no lamina is left to fill in the loss of the bone, when some of the teeth, corresponding to that inequality, are loosed than the others; and when a crevice is perceptible on joining the two pieces of the jaw as with plaster; there can be no doubt of a fracture. When the pieces are impacted, or the bone disabled by a wound, the case is (if possible) still more manifest.

Fractures of the mandible produce great pain near the seat, particularly when the jaw is moved; and a crevice may also be felt.

Fractures of the lower jaw, whether simple or double, are easily set by passing the displaced part upwards and a little forwards, and then passing in the ends of the bone, so as to bring it exactly on a level with the portion which has preserved the natural position. Indeed, the correctness of the reduction can always be rightly judged of by attending to the line which the line of the jaw ought to form, and observing that the neck of the teeth is as regular as before will allow. The best means of the reduction, however, is difficult; and can only be well executed by supporting the lower jaw, and keeping it applied to the upper one. As the latter instrument cannot be properly applied in persons whose teeth are very irregular, it is sometimes necessary to introduce an even piece of cork between the teeth on each side of the mouth, and against this rock the lower jaw is to be kept up with the bandage previously secured, while the aperture left between the osseous in the situation where no teeth is placed, allows food and medicines to be introduced with a small spoon.

As soon as the fracture is set, the surface should always have thin parietal plaster, previously wet and thickened with vinegar, to the outside of the jaw, both along its side and across its front. Over this plastered parietal a bandage with four turns is to be applied, the centre being placed on the patient's chin, while the two extremities take care to be placed to the front part of a napkin, and the two anterior ones fastened by a part of the same napkin across backwards. When the parietal plaster becomes dry, it forms the most convenient apparatus imaginable for supporting and supporting the fracture. A piece of soap-plaster may now be applied to the teeth underneath, which will prevent any dislocation of the hardness and pressure of the parietal plaster.

Had the bone been merely cracked, the patient should be allowed only such food as does not require mastication, and it may be given by means of a small spoon, introduced between the teeth. Rootes, soups, jellies, tea, and other fluids appear most eligible.

In order to keep the middle portion of the bone from being drawn downwards and backwards towards the larynx, it is frequently necessary to apply tolerably thick compresses and under and behind the chin; which may be well supported by the bandage already described.

I need hardly state the necessity of joining the pieces as soon as setting, or moving the jaw more than can possibly be avoided.

When the condyle is fractured, as it is uncommonly

drawn forwards by the action of the pterygoid muscles, and on account of its deep situation cannot be pushed back, the lower portion must, if possible, be pushed into contact with it. For this purpose the bandage must be made to operate particularly on the angle of the jaw, where a thick compress should be placed.

Compacted fractures of the lower jaw are to be treated on the same principles as similar injuries of other bones. If possible, the external wound should be healed by the first intention; and when this attempt fails, may must be taken to keep the wound clean by changing the dressings about once in three days; but not often, lest the fracture suffer too much disturbance. It is observed that compound fractures of the jaw, and even simple ones, which are followed by abscesses, are particularly liable to be succeeded by troublesome and tedious exostoses.

In very bad fractures, in which all motion of the jaw must have the most pernicious effect, I consider it prudent to administer every kind of nourishment in a fluid form through an elastic gum catheter, introduced through one of the openings down the oesophagus.

Now and then happens that fractures of the lower jaw become situated: Dr. Pagnan's successful treatment of one such case with a seton I have already noticed.

Fractures of the Vertebrae.

On account of the shortness and thickness of these bones, they cannot be broken without considerable violence. The spinous processes which project backwards are the most exposed to such injury; so they are the weakest parts of the vertebrae, and most superficially situated. On this account it is possible for them to be broken without any mischief being done to the spinal marrow. The fracture, which is gross enough to break the bodies of the vertebrae, must produce a greater or less extension or other mischief of the spinal marrow; from which almost such more pernicious consequences are to be apprehended than from the injury of the bone abstractedly considered. The displaced parts of bone may press on the spinal marrow, or even wound it, so as to occasion a paralytic effusion of all the parts which derive their nerves from the continuation of this substance below the fracture.

Mr. Astley Cooper divides fractures of the bodies of the vertebrae with displacement into two classes; first, those which occur above the third cervical vertebra; and, secondly, others which happen below that bone. The first class, he says, are almost always immediately fatal, if the displacement be to the great extent. In the second description of cases, death takes place at various periods after the injury. The reason of this difference is ascribed to the circumstance of the pressure being exerted from the third and fourth cervical parts, whereas in the first class of cases death is taken, almost produced by paralysis of the diaphragm, and the stoppage of respiration. (On Dislocations, p. 520.)

As the more common of the more easy to detect symptoms which very much resemble those usually occurring when the vertebrae are fractured, the diagnosis is generally obscure. An inequality in the line of the spinous processes, and a crevice may sometimes be distinctly felt. The lower extremities, the rectum, and bladder are generally paralytic; the patient is afflicted with retention of urine and stool, as with an involuntary discharge of the latter. (Ibid.)

If the lower vertebrae be displaced, the lower extremities are rendered so completely insensate, that they may be pinched, burnt, or blistered without the patient suffering any pain. The pain at such cases is generally erect. In general, also, according to Mr. Astley Cooper's observations, patients with fractured lower vertebrae die within a month or six weeks; but he knows of one patient that lived two years, and then died of gangrene of the nates. In fractures and dislocations of the dorsal vertebrae, the symptoms are very singular; but the paralysis extends higher, and the abscess becomes more frequently infected. Death commonly follows in two or three weeks; but Mr. Astley Cooper mentions one case, in which a gentleman enjoyed the northern climate. Fractures of the cervical vertebrae, below the origin of the phrenic nerve, occasion paralysis of the arms, though it is seldom complete. Sometimes, when the diaphragm is relaxed, one arm is more affected than the other. As the ribs

* (Dr. J. Blane, Baron, of Philadelphia, to whose account of skulls I have had frequent occasion to allude, has devised a bandage for fractures of the jaw, to which a preference is now generally given in this country, as well for its simplicity as, judging the fragments in a state of compression for the facility with which in securing the dressings, and in applying to wounds of the face and other. He observes with "a roller an inch and a half wide just before the prominence of the chin, and continues it obliquely over the centre of the fractured bone across the fracture of the jaw and ear, and carries over the zygomatic arch, under the chin, and passing the same direction on the opposite side and is as tight as the back of the hand; he then passes it obliquely around and parallel to the base of the lower jaw over the ribs; and continues the same degree on the other side until it ends where he commenced, and repeats."—Ibid.)

costal muscles are paralytic, great difficulty of respiration prevails. The abdomen is also considerably inflated. Death generally follows in from three to seven days.

Mr. Andrew Cooper notices the following as the appearance fitted in the direction of each vessel. The spinal process of the damaged vertebra is depressed; the anterior process is fractured; the body of the vertebra is broken through; the segment very tapering in the intervertebral substance. The body of the vertebra usually projects forward as an arch or an inch. Between the vertebra and the sheath of the spinal marrow blood is extruded, and frequently on the lower part itself. When this effusion is slight, the spinal column is compressed and inflamed. When greater, it is torn by the bony arch of the vertebra process, and a ridge is raised at each end, but the dura mater contains whole.—(See A. Cooper on Dislocations, &c. p. 328, &c.)

Fractures of the spinal processes without other serious mischief are not dangerous, and are the only instances of fractures of the vertebra which admit of being treated with certainty.

Any attempt to set fractures of the bodies of the vertebrae, even with the known or exact, would be both useless and dangerous. General treatment can alone be employed. Opiating will tend to prevent inflammation in the structure of the injury. When the patient is allowed with a liberal diet, the inflammation, swelling, hemorrhage, &c. the body may be rubbed with camellia oil, and purgative elixirs and antispasmodics given. If requisite, the spine may be supported with a castor. When the bladder, rectum, and lower extremities are paralytic, it is common to rub the back, loins, extremities, and limbs with liniments containing the Chinese oil.—(Bayer.) With respect to the external and internal use of stimulants, however, it can never be judicious, when there is reason to apprehend much inflammation of the injured parts; and as for the blood thus entering the nervous system, there can be little rational reason, the cause of the inflammation being here of a mechanical nature.—(Bridges, Med. Obs. t. 3, p. 222.)

Some authors recommend depressing, or turning out a portion of the fractured bone, when the compression of the spinal marrow is injured by a splinter is suspected; but, according to my judgment, the indication can never be sufficiently plain to authorize the operation, which, on account of the great depth of the intervertebral and parts, must be very tedious, and even difficult to effect, without a great risk of increasing the injury which the spinal marrow may already have received. An unsuccessful operation of this kind was once performed by Mr. H. Chase, and quoted by Mr. Tyrrell.

Some cases, published by Mr. C. Bell, tend to prove that the danger to be apprehended from injuries of the vertebrae of the spine is that which accompanies injuries of the brain. Hence, he joins the possibility of suppurations in recommending general and local bleeding, and keeping the patient perfectly quiet. And, with respect to operations for the removal of fragments of bone, it is his decided belief, that an incision through the skin and muscles covering the spine, and the withdrawing of a portion of the shell of bone which surrounds the marrow would be extremely fatal; the membranes of that part being particularly susceptible of inflammation and separation. And even if a sharp spear of fractured bone had run into the spinal marrow, and caused pain at the lower part of the body, Mr. C. Bell thinks that exposing the medulla to extract the fragment would so aggravate the mischief, that inflammation, suppuration, and death would be the inevitable consequences.—(Surgical Obs. vol. 1, p. 157.)

The same author describes inflammation of the spinal marrow as attended with its above mentioned nervous crisis, which is particularly followed by excitement of the brain in this manner, heat is poured into the sheath of the spinal marrow, and vitæ by its poisonous contained filer, or by its infection, destroying the functions of the part so as to be attended with the same consequences. The excitement of the brain being followed by effusion, death ensues.—(Id. 169.) Cases are also referred to, where palsy of the lower extremities occurs on several months after an injury of the spine, owing to thickening of the membrane of the medulla, or disease of the latter part itself. How Mr.

C. Bell recommends previsions in local bleeding and deep incision.—(P. 169.)

A fracture of the processes dorsales seems instantly fatal, as happened in the example mentioned by Mr. A. Cooper.—(On Dislocations, &c. p. 343.) In the practice of Mr. Elliot, a case occurred, in which a leg with a fracture of the atlas lived a year after the accident.—(A. Cooper, op. cit. p. 343. See also J. T. Sherrington, Remerciement after Polytraumatisme and Shock des Joints, Gazette des Hôp., 1820. F. J. P. Garroble, Des Mal. Chir. internes, Casus. Scissurationis Vertebrae Thoracis Fractura costalis, postquam Extremities a viris diti Symptomata delinquentia duxerit Septimum Junius, Argent. 1761. Cases of Fractured Spine, London, vol. 2, p. 35.)

FRACTURES OF THE STERNUM.

The sternum is not frequently broken, and the removal of this fact is required at the position of this bone resting, as it were, upon the cartilage of the ribs, and also in some instances to its spongy nature. When the accident does occur, it is from the direct application of external violence to the injured part; and never the fracture is always accompanied with great mischief, or even a wound of the sternum, and more or less injury of the thoracic viscera. As Bayer remarks, the sternum, in consequence of the elasticity of the cartilages of the ribs, may be readily pushed back by pressure in this direction; and the result is a natural change in the form, and a real dislocation, if it does. Now, since this cavity is always supplied filled by its contents, three situations cannot happen in a considerable and sudden manner, without a risk of the thoracic viscera being crushed and even ruptured.—Thus, when the sternum has been fractured in violent blows in the chest, the heart and lungs have been found to be severely contused, and sometimes lacerated, and there will always be positive danger of such mischief, when the fracture is attended with depression of one or more of the fragments. In some cases, a large quantity of blood is effused in the external portions of the anterior mediastinum; and, in others, the air is followed by inflammation and suppuration in the same situation, and necrosis of the broken part of the bone. Since the lungs are also liable to be injured by the same force which causes the fracture, it would be the depressed pieces of bone, especially may become another complication, as we are exemplified in a case related by Pajon.—(Collected Observations, &c. at Chap. t. 2, p. 214, &c. Rome, 1820.)

A fracture of the sternum is rendered obvious by the inequalities perceptible when the surface of the bone is examined with the fingers; by a depression at the site of the broken piece; a swelling, and an unusual soreness of the injured part in respiration. In many cases, the fracture may be seen, the soft parts being torn or otherwise wounded. The healing is difficult, and mostly accompanied with much effusion of blood, suppuration, and liability to form the look according to the observations of Pott and Haller; several of these latter symptoms may continue, with less intensity, a long while after the fracture is cured.—(Lewell, Nouvelle Méthode Chir. t. 2, p. 343.)

Fractures of the sternum, when more extensive, and, of course, only require common treatment; viz. a piece of soap-plaster to the situation of the injury, a rib band the chest, quietude, bleeding, and a few opium with a view of preventing what may be considered to be the most dangerous complication, inflammation of the parts within the chest.

In cases attended with great depression of the fractured bone, the necessary incision should be made in order to raise with an elevator the portions of the broken sternum, or to extract with forceps any loose portions, which seem to be strictly compressed. However, it is not often necessary to replace the sternum, unless to raise a depressed portion of still bone or to give vent to extravasated fluid. In the few of these circumstances, I believe, with Mr. C. Bell, the successful application of the trepan can never be easily necessary. Should the surgery may be called upon to extract large portions.—(See Operative Surgery, vol. 2, p. 628.) Such an operation, however, may sometimes be proper when abscesses form under the sternum or the bone is affected with necrosis, and the separation of the damaged parts is likely at any considerable time.

Functurae of the alveoli are more frequently produced by gun-shot violence than any other class, and in these cases, there are generally entire epididymis rupturing extrinsically. At the battle of Marston, the French general Chaucer received such a wound, with which he lived nearly a month: the injury was attended with no many epididymis, but when they were removed, the pulsation of the heart was visible to a considerable extent.—*Ipswich, vol. ii, p. 244.*

The scapulothoracic articulation, which consists of two synovial joints, is liable to fracture. Little injury, however, can be done to this joint, a case, thus releasing the subclavicular muscles by raising the thorax and pelvis, and then applying a piece of wet plaster and a roller over the part, for the purpose of keeping it steady. When the chest has been restored, the patient should always be laid.

FEATURES OF THE LINE

These generally happen near the greatest convexity of the base, several of which are often broken together. The first rib being protected by the diaphragm, and the inner ribs being very flexible, are less liable to be fractured than the middle ones.

When the spirit of a fractured rib is broken inward, it may lacerate the pleura, wound the lung, and excite the dangerous train of symptoms attendant on emphysema.—(See Emphysema.)

A pointed stenosis of the rib, projecting upwards, may also cause an inflammation of blood; or by its irritation produce inflammation in the vessel. A fracture which is not in all displaced is very difficult to detect, particularly in the scapula; and its weight is very frequently never discovered. The scapula should always be felt on the part where the patient seems to experience a prickling pain in the absence of inflammation, or where the violence has been applied. The patient should never be requested to cough, in which action the ribs must necessarily heave to a uniform motion, by which a fracture will often be rendered perceptible. All the best practitioners, however, and in the last resort adopting the same measure, when there is reason to suspect a rib to be fractured, as if there were usually known to be the case by the occurrence of a crepitation, or the progress of one end of the fracture; which, united, in the fractures which are displaced, makes the state of the accident sufficiently plain.

A broken rib is treated by dislocation either in the direction of the diaphragm of the breast, or in that of the pleura. The rib, being fixed positively in the centre, and uniformly in the strength, cannot become dislocated. Nor can one of the broken pieces become higher or lower than the other, because the same muscles are attached to both fragments, and keep them in an equal distance from the neighbouring ribs. The only possible dislocation is either upwards or downwards. However,

slange fractures of the ribs, due from urgent expiration, require very simple treatment. The girded object is to keep the broken bones as immovable as possible. For this purpose, after a piece of soap-planer has been applied to the side, and over a proper compress, a broad linen roller is to be firmly put round the chest, so as to exclude the action of the ribs, and compel the patient to perform respiration chiefly by the descent and elevation of the diaphragm. A secondary aim prevents the tendency from slaying downwards. When the fractured rib is depressed inward, the compresses should be placed on the anterior and posterior part of the bone. As a roller is not to become slack, many surgeons, with good reason, prefer a piece of strong iron, large enough to surround the chest, and lined with pack-thread, so as to compress fibres in the due degree.

When there is fracture, from the symptoms, to think the legs injured, as supposed to arthritis, excruciating and agonizing bleedings should be practiced. Indeed, as post-mortem is always liable to excruciating the patient, and as a most dangerous contraindication, every person free from debility, either having a broken rib, or supposed to have such, should always be bled: it is the first instance. The epistomized patient, with opium, is an excellent medicine for opening any cough, which may destroy the fracture, and give the patient infinite pain.

FACTORS OF THE RATIO

Although never superficial, than the other leaves of the genus, the spectrum is less irregularly fringed; a fact evidently, as Hoyer has remarked, by its thick-

ness, its springy texture, and the advantageous way in which it supports the weight and efforts of the whole trunk. For the reason to be broken, the violence must be very great, like that resulting from the fall of a very heavy body, or the passage of a carriage-wheel on the narrow sole of the bone, or a fall from a great height on that part. On the other hand, fractures of the scapula, when they do happen, are more common than those of the case is tonight, because, in addition to the first degree of contusion and laceration, with which they are connected with the latter ones are complicated, there is almost always great damage done to the neural nerves; a kind of injury which may have fatal consequences. Hence extension of time, inability to retain that fluid, necessary discharge of the bone, paralysis of the lower extremities, &c. Another personal danger also depends upon the injury which the pelvic viscera may have suffered from the same violence which broke the bone.

When the structure is situated at the upper part of the incision, which seldom happens on account of the thickness of the bone in that situation, there is no displacement, unless the bone is completely, and the fragments are driven inward by the same force which produced the fracture; a case which always requires great injury of the external and internal soft parts. As the whole fracture occupies the lower portion of the bone, where it is less thick, the inferior fragment will be displaced inward, towards the incision. And, as Boyer observes, *fractures of the upper part of the bone are not in general easily detected.*—(*Prat. de Med. Chir.* t. 3, p. 152.)

When the evidence has been such as to make it probable that it has extended its efforts to the police, viz., that they stand in the power of an evil and to be adopted for the prevention of infestation. In particular, as people living should be practiced, and, if necessary, repeated. Lessons should also be applied in the vicinity of the courts, and the para-legal cases with the local police courts. Any delay, either in the examination or prevention of the crime and loss, will also cause delay in the immediate and continued attention. (See *Review, Refutation of; Jurisdiction of, &c.*) With regard to the particular means for preventing the union of the structural members, speaking in the most important, and after the risk of infestation is over, all that can be done is to apply a piece of the employment, as it is to the poor, and put a collar around the neck, or a T. bandage.

FRACTURES OF THE C6 VERTEBRAL

Though much stiffer than the exoskeleton, it is less frequently broken, because less exposed to external force, and capable of a degree of movement, by which it eludes all effect of violence. But in *silvery* persons, in whom the different pieces of the os coracoclavicularis are connected by arthroclasis, a fall on the buttock may fracture the bone. The accident is known by the torbidity of the fragments, and the acule pain produced when the flaps are moved; the fragments being then distributed by the action of the gluteal muscles, some of whose fibres are attached to them. (Cramer, l. 2, p. 350.)

The treatment of fractures of the os coxae consists in exposing the fracture, establishing displacement or non-displacement, according to the particular state of the soft parts, and taking blood away from the patient, adopting the antiseptics, regimen, and retaining the patient in a recumbent position his back or sitting down. He should also avoid walking, so as to put the great muscles into action, which would disturb the broken bone. All formal attempts at reduction are not only useless in respect to the fracture, but highly injurious to the soft parts, which are not in a state to bear handling without ill effects.

FLATTENING OF THE ORAL TECHNIQUE.

The structure and shape of the oar (scapula), and the thickness of the soft parts by which they are covered, explain why they are less often fractured. When such accidents happen, they are generally produced by the pressure of heavy carriage-wheels over the pelvis, falls from great heights, the kick of a horse, &c., and are always attended with considerable contusion of the external soft parts, and sometimes with great injury of the pelvic vessels. The urine appears opaque, and the blood is sometimes broken off by the kick of a horse. (Roux.)

The two ossa innominata may be broken together; but commonly only one of them is thus injured. Most frequently the fracture takes place in the upper epipubic portion of the bone, known under the name of the *Alia*, though sometimes it happens either in the ischium or the os pubis. The violence of contusion may be limited to one part of the bone, or extend to several parts of it; and there may be a greater or less number of fragments, and these unconnected or not with displacement. In many instances, in which the pelvis has been violently shaken between two bodies, or run over by a heavy carriage, the bones of the pelvis, besides being fractured, are dislocated, some presenting examples of which would have been recently published.—(A. Cooper's *Surgical Remarks*, part 1, p. 256 &c.)

During my apprenticeship, at St. Bartholomew's Hospital, several cases occurred in which the os ilium, or ischium, or os pubis, were forced fractured on opening the bodies after death; and when the great violence necessary to produce the accident is considered, we cannot wonder that the injured parts of the pelvis should frequently prove fatal. Fractures of the ossa innominata are invariably attended with more or less contusion of the soft parts on the outside of the pelvis; and when the violence has been very great, the pelvis viewed may be seriously bruised, sprained, or lacerated, and the large nerves, contained in the pelvis, or the spinal marrow itself, injured: hence, extravasation of blood, or effusion in the cellular membrane of the pelvis; ecchymosis deeply seated even in the substance of the muscles or other organs; injury of the kidneys; complete loss of motion; a paralysis of the lower extremities; a discharge of blood or a black ichthyous matter by vomiting or stool, either immediately or at more or less distant periods from that of the accident; retention of urine; fever; painful tension of the abdomen, more or less inflammation of the peritoneum and bowels; the formation of abscesses, which are sometimes of great extent; sloughing; and death.—(Hager, *Trakt des Huf. Chir.* t. 2, p. 154.)

As the same article has observed, the violence necessary to fracture of the ossa innominata may produce a displacement of the fragments, and vary than from or less away from their natural situation. When the piece of os ilium is broken, the splinters may be propelled into the canal of the urethra, or even through the bladder, and give rise to extravasation of the urine; or by merely compressing these organs, they may cause more or less interruption of their functions. But unless the fragments be displaced by the same force which caused the fracture, they can hardly be drawn out of their place by any other circumstance; when they are retained by the splinters attached to both fragments, and by surrounding ligamentous expansions.

Owing to the deep situation of fractures of the pelvis, and to there being no displacement nor mobility of the fragments, the diagnosis is sometimes attended with great difficulty. A specimen of the accident may be mentioned, when the pelvis had suffered great violence, the patient experienced great agony, and all motion of the trunk and lower extremities is difficult and painful. Under these circumstances, if the fracture should be in the ischium, especially the lesser and front portion, as in the os pubis, the mobility of the fragments or even a crepitus may be distinguished in a thin subject, if when he is lying horizontally, with his thighs well legs bent, and his head and chest elevated, the projecting point of the os innominatum be taken hold of, and an attempt be made to move the fragments in opposite directions. In such instances, however, no certain is given by Hager, viz. not to mistake the crepitation of air in the lungs, when attending large extravasations of blood, for the grating of the fractured bone.

In cases in which the fracture affects a part of the os innominatum very deeply placed, and it is limited to a single point of the os pubis or the ischium, so that no detached movable fragment has been produced, the exact nature of the case is easily made out with certainty before the patient's death, and the dissection of the parts.

Fractures of the ossa innominata are cases accompanied with serious danger. When the fragments are displaced, and do not admit of being reduced again,

the disorder arising from this release may have fatal consequences. And, as Hager observes, even when such displacements do not exist, these fractures are not less to be apprehended on account of the injury which the spinal marrow and the nerves, vessels, muscles, and viscera within the pelvis are likely to have sustained. These complications, which are almost inseparable from the fracture, may prove indeed directly fatal, by destroy the patient at a period more or less remote from the time of the accident. One striking accident of this kind, which I saw about two years ago, with Mr. Pies, of Cologne, proved fatal in about half an hour. Sometimes, however, the fracture is not extensive, and the violence which produced it has not caused any very serious injury of the vessels and soft parts; yet examples of this kind are numerous.

In these last cases, which are the most simple, a cure of the fracture may be easily effected by means of rest; a position in which all the chief arteries attached to the pelvis are relaxed; constant application; and, a ruler, or T bandage.—(Hager, *Trakt des Huf. Chir.* t. 2, p. 154.) The great indication is to preserve the continuation of influence of the parts within the pelvis, and even of the peritoneum and adjacent viscera, by repose and supported mobility. Any complication respecting the extension of the area and floor might also receive immediate attention. When there is great contusion, and the bones are very badly broken, the pelvis cannot bear the weight of a band without suffering the most excruciating pain. In all first cases assistance is such circumstances, there is a particular case, passed a piece of strong gauze was under the pelvis, and, collecting the currents into one collected state in a pelvis suspended from the top of the bed. This enabled the patient to move around with very little efforts, so that a bed could need to be placed under him. It appears to me that a bed constructed on the principles recommended by the late Mr. James Esch, might be of infinite service in these cases, as well as in many others, particularly complicated fractures and paralytic affections from closed fractures.—(See *Observations on Fractures of the Lower Limbs*, to which is added an account of a contraindication to amputation, and comfort in the lower limb, by Sir J. Keir, M.D., &c.) Mr. Esch has also mentioned his mechanical apparatus with great success in the treatment of a bad scrofula, and indicated for the treatment of fractures, and other cases, in which it is an object of high importance to enable the patient to empty the bowels without changing his position.

Sometimes, notwithstanding the fragments adhere antipathetically to each other, abscesses continue to be produced from sitting on the pelvis; particularly when they are detached splinters driven inwards. These abscesses of matter should be opened as soon as a small fluctuation can be felt. The splinters may wound the rectum or bladder, and cause an extravasation of urine. I should extremely regret what had happened to effect from the bones of a normal case, as the discharge of the effused urine. In these cases, a catheter should be kept introduced, in order to prevent the urine from collecting in the bladder, and shortening its length by itself into the cavity of the abdomen.—(Cooper.) A very interesting case of fracture of the ossa innominata, attended with rupture of the bladder, and followed by a fatal peritonitis, has been recorded by Cooper.—(Narrative Journal de Médecine, Mars, 1819.) The ossa pubis were forced half an inch from each other. The horizontal branch of the pubis, and the ascending ramus of the ischium, were broken; the ureters dislocated from the ossa ilium, and extravasated within the cavity of the pelvis. The right sciatic artery aneurysm was broken only at its first part, and the blood still retained their momentum. A large quantity of blood was found extravasated in the bladder, and about the peritonea. As soon as the abdomen was opened, three pints of a yellowish fluid, looking a styptic fluid, immediately gushed out. In this case, catarrhes of various kind were extremely even a syphilis adapted to these was said, but nothing could be done except to let a little stream of blood. The possibility of mistaking a fracture of the innominata for a dislocation of the thigh-bone, and the difference of these cases as explained by Dr. A. Cooper, have been mentioned in the article on Scrofula.

FRACTURES OF THE THIGH.

The os femoris is liable to be broken at every point, from its condyles to its very head; but it is at the middle third of this extent that fractures mostly occur. The fracture is sometimes transverse, but more frequently oblique. The latter direction of the injury makes a serious difference in the difficulty of making the case without future deformity or lameness. Sometimes the fracture is comminuted, the bone being broken in many places; but one, and sometimes two, are associated with a wound, communicating with the fracture, and making it when it is termed compound. As Pott remarks, however, the thigh-bone is less seldom broken into several pieces than other bones more extensively studied.

A fracture thigh is attended with the following symptoms: a local acute pain at the instant of the accident; a sudden lameness; it is usually a limb; a preternatural mobility of one portion of the bone; sometimes a very distinct crepitus when the two ends of the fracture are moved against each other; deformity in regard to its length, thickness, and direction of the limb. The latter change, viz. the deformity, might be so accurately calculated; for, having a cerebral faculty to *feel*, especially in oblique fractures, our disfigurement at the treatment is in previous time. (Desault, *op. cit.*, t. 1, p. 181.)

Oblique fractures of the thigh are attended with deformity. When this is considered in relation to length, it appears that, in oblique fractures, the broken limb is always shorter than the opposite one; a circumstance arising from the ends of the fracture slide over each other. We may also easily convince ourselves, by examination, that the deformity is owing to the lower end of the fracture having ascended above the upper one, which remains stationary. What power, except the muscles, can communicate to the lower portion of the fractured bone, a motion from below upwards? As several attached to the pelvis and at the other to the part of the bone, the patella, the tibia, and fibula, they make the former assume their fixed point, and drawing upwards for leg, the knee, and the lower portion of the thigh, they raise directly or indirectly the displaced extremity. In producing this effect, theiceps, semitendinosus, semiperoneus, semitarsus, gracilis, sartorius, &c., are the chief agents.

For the purpose of enervating the power of the muscles to displace the ends of the fracture, attention is made, in Desault's works, by Bistot, of a carpenter who fell from a scaffold and broke his thigh. The limb, the next day, was as long as the other; but the man had a complete palsy of his lower extremities, and would not discharge his urine. The man was applied, the muscles were relaxed their power, and then the shortening of the limb began to make its appearance.

Besides the action of muscles, there is another cause of displacement. However firm the bed may be, but which the patient is laid, the bedclothes, more prevalent than the rest of the body, soon form a depression in the middle, and thence follows an inclination of the place on which the trunk lies, which, gliding down some downwards, pushes before it the upper end of the fracture, and makes it ride over the lower one. The muscles, irritated by the points of bone, become their contraction, and draw upwards the lower part of the bone; and from this double motion of the two ends of the fracture in opposite directions, there sliding over each other results.

Transverse fractures are less liable to be displaced in the least when, in position of the bone, because, when one is correct, the ends of the fracture being a natural resistance to each other, the lower ends, drawn upwards by the muscles, remain with assistance from the upper one, which being itself retained downwards by the weight of the trunk, pushes the former before it, and thus both retain their position in relation to each other.

The deformity of a fractured thigh, in the transverse direction, always communicates that which is lameness; but sometimes it arises from. This is the case, when, in a transverse fracture, the two ends of the bone lower their ends, one being external upwards, the other internal, or one remaining in place, while the other is separated. The upper end of the fracture is not now, as in the foregoing instance, motionless in regard to the movable action; the contraction of the

peroneus, psoas, iliacus internus, and upper part of the triceps, draws it from its natural direction, and communicates to it motion.

The deformity of the limb in regard to its direction, is either the consequence of the blow, which produced the fracture, or, what is more common, of the ill-directed treatment of persons who carry the patient. Thus we see that an injudicious posture bends the two portions, so as to make an angle.

Whatever may be the kind of deformity, the lower end of the fracture may retain the natural position in which it is placed, or, on the contrary, a rotatory motion to which it is liable, or, on the contrary, a rotatory motion to which it is liable, which is very common, is towards, which is more unusual. This position always aggravates the displaced state of the fracture, and should be attended to in its reduction. (Desault, *op. cit.*, t. 1, p. 180, 185.)

Every one, at all initiated in the surgical profession, knows that there are two very different methods of treating fractured thighs. In one, which was much resorted to and practised by Desault, and is still universally positioned in France, the limb is kept in the straight or extended position. In the other, the limb is laid upon its side, with the knee bent; a mode which was employed by the celebrated Mr. Pott, and since his time has found many partisans in this country. To these two positions for fractured thighs, we may now be added that in which the patient lies upon his back, with his thigh and leg in the least position, supported on two oblique planes, or surfaces, the open angle of which is towards the knee. This last position, however, has been more particularly recommended for fractures of the neck of the femur, though, if it be advantageous for them, I see no reason for not giving it a fair trial in other fractures of this bone.

That Mr. Pott did not of certain advantage of the straight position; that he was blind to the imperfections of his last position; and that he exaggerated the power, which we have, of withdrawing all the muscles of a limb by palsy; I am detecting suspicion of the present day will be inclined to deny.

Were we to weigh the privilege of thinking for ourselves, and especially to mould our opinions according to any authority, however high, we should either fall into very considerable errors. Were we to believe the blind faith or opinion passages in Mr. Pott's Remarks upon Fractures, we should suppose possible and practicable to relax at once, by a certain posture of the limb, every muscle associated with a fractured bone. If the first vol. of his works, page 283, vol. 1793, he observes, in speaking of what some best answer the purpose of insensibilizing the muscles from displacing the fracture: "Is it not obvious, that putting the limb into such position as still relax the whole set of muscles belonging to, or in connection with, the broken bone, must be superior such purpose?" And in the next page, "What is the reason why we must, however superficially acquainted with the art, ever think much trouble in setting a fractured os humeri? is it not because both practical and experienced in putting the arm into a state of flexion, that is, into such a state as relaxes all the muscles surrounding the broken bone?" Also, in page 285, he continues, "Change of posture must be the remedy, or rather, the placing the limb in such position as to relax all the muscles." This to have all the muscles relaxed in cases of fracture would be desirable, were it also practicable, every one will admit; but the possibility of accomplishing it, so long as different muscles have different uses, different attachments, and different sympathies to the bones, every one must grant to be only a visionary project. For instance, to sit the patient and support, in the case of fractured os humeri, extended to above, rather than in putting the fibres of the biceps and coracobrachialis into a state of tension, at the same moment that they relax the triceps and brachialis externus!

The position of the fractured os femoris, says Mr. Pott, should be on its outside, resting on the great trochanter; the patient's whole body should be inclined in the same side; the knee should be in a middle state between perfect flexion or extension, or midflexion; the leg and foot, lying on their outside also, should be well supported by pillows, and, should be rather higher in their level than the thigh; one very bold spirit of soul, halberd cut and well covered with wool, rat, or tow, should be placed under the thigh, from above the trochanter quite below the knee; and

spines, somewhat shorter, should extend from the groin below the knee on the inside, or rather in this position on the upper side. The bandage should be of the eighteen-fold kind, and when the knee has been set, and the thigh well placed on the pillow, it should rest, without necessity (which frequently in this method will seldom occur), to ever moved from a single, until the fracture is united; and this union will always be accomplished in less of less time, in proportion as the limb shall have been more or less disturbed. — (Part.)

Here only two spines are mentioned; the surfaces of the femoral diaphysis employ four. After placing the patient in a proper position, the necessary extension is to be made. Then the under spine, having upon it a broad foot, pad, and an eighteen-fold bandage, is to be laid under the thigh, from the great trochanter to the water study. The surgeon, before applying the soap plaster, laying down the tails of the bandage, and putting on the other three spines, is to take care that the fracture lies as evenly as possible.

In the position for a fractured thigh, Mr. Pott, we feel, directs the leg and foot to be rather higher in their level than the thigh; with what particular design, I have not myself been able to make out. Whoever hesitates upon the consequences of elevating the leg and foot above the level of the thigh, in the best position, will know that it is to twist the convulsion of the os femoris more outward than is natural. When a patient is placed according to Mr. Pott's direction, upon a common bed, the middle does sit in as much less the leg becomes situated very considerably higher than the thigh, and I am disposed to think that this is one cause why so many broken thighs are cured in so deformed a manner, that the foot remains permanently dislocated outwardly. The great propensity of the troops and other muscles to produce this effect, may also serve to explain the frequency of the deformity. It is not merely the depression of the middle of the bed which is disadvantageous: as the weight of the patient's body falls more upon one side of the bed than the other, in the best position of the limb, unless the sitting is tight and the mattress very firm, it happens that such a deformity is formed as to render it exceedingly difficult, if not impossible, to make the patient continue daily upon his side. It cannot be expected too forcibly, that fractured thighs should always be laid upon beds and pillows to sink much. When this happens, no rational dependence can be put in the efficacy of the best position, and, as Desault has explained, the better thing is hurried also in the struggle posture.

The most enthusiastic advocates for the best position, must allow, that it leaves the leg and foot too movable and unsupported, and that, though it may relax the muscles, which have the most power to destroy the resistance of a fractured thigh, it yet leaves a want of muscle sustained, quite sufficient to destroy the cure of the bone. Hence, practitioners should endeavor to improve the apparatus employed, so that it may make a permanent resistance to the action of the muscles, and in the straight position such resistance may certainly be produced with great effect and convenience.

The weakness of Mr. Pott's observations on fractures would lead me to suppose, that had the moment a wound is partially closed, it becomes incapable of sitting on or distending a fracture. Now if this were correct (which it cannot be), we should not have the power of completely healing an extending war wound; but as soon as the set of muscles designed for this purpose were partly relaxed by the distention or half-extension of the joint, they would be deprived of all further power. Therefore, in addition to the arguments to be brought against the best posture, arising from its not actually relaxing all the muscles connected with the broken bone, we are also to take into the account the fact, that the partial relaxation of any muscle by no means incapacitates it from acting.

In the earlier editions of the Dictionary, I expressed a preference to Mr. Pott's method of treating broken thighs. Now entire reflection, however, and subsequent experience have made me a convert to the recommendation of Desault on this subject. The terrible compound fractured thigh, which I had under my care in the carriage in Holland in the year 1715, could not have been at all relieved by any apparatus yet merely upon the thigh itself. The extremity of long spines, situated the whole length of the trunk, was in those cases particularly necessary. With such spines, which

surround steadily the fracture itself, the knee, leg, ankle and foot, year passed that, in fact, even be removed upon an emergency from one place to another, without any considerable disturbance of the broken part. The few spines to be done in the best position, with short spines, merely applied to the thigh, suffering no sleep to the leg, and not containing the surfaces of the broken bone.

There are some excellent remarks on the treatment of fractured thighs in the writings of Desault. It is observed, that, if we compare the natural powers of displacement with the artificial resistance of almost every apparatus, we shall find that the supposing between such forces is too great to let the bones go to the latter. The action of the muscular power, which is always at first very strong, may afterwards be gradually diminished by the extension exerted on them. A power incessantly operating can effect what another greater power, temporarily applied, cannot so soon accomplish, and the compression of several bandages tends also to lessen the force of the muscles.

Desault entered in the History of the treatment of fractured thighs, without any kind of deformity. This system, it is said, was owing particularly to the well-contrived employment of extension and compression of the muscles. The advantage of making the muscles a long while extended, in order to diminish their power, is especially evident in the reduction of certain dislocations, as those of the shoulder, in which we often cannot succeed till the muscles have been kept on the stretch for a greater or less time. The fracture of the patella and olecranon equally demand the utility of compression for the same reason; as when the muscles are not steadily compressed by the bandage, they draw upwards the fragments of bone with double or triple force.

To the reduction of fractured thighs in the best position, Desault entertained the following opinions: the difficulty of making the extension and counter-extension, when the limb is so placed; the necessity of that as playing them in the fractured bone itself, instead of a situation remote from the fracture, as, for example, the lower part of the leg; the impossibility of comparing with precision the broken thigh with the sound one in order to judge of the regularity of the shape; the disadvantages of this positioning contrast, though fully diffused, with most naturally the bones, vessels and parts of a part of the trunk on the great trochanter of the affected side; the impossibility to which the limb is exposed when the patient lies in motion; the difficulty of fixing the leg firmly enough to prevent the effort of its motion on the thigh-bone; the necessity of adopting this method, when both thighs are fractured; lastly, experience in France having been little in favour of such posture.

Also, what is gained by the relaxation of some tendons, is lost by the tension of others. The such persons (nearly always men), Desault considered the best position, and always employed the straight one, which was advised by Hippocrates.

But, Hennen, and Duvetney considered the straight position to be applied just above the condyles of the os femoris. Duvetney remarked that this position rendered it necessary to employ very great force, and he preferred extension over the foot. Hennen also was considerable the inconvenience of the partial pressure made on the muscles, which, increasing and relaxing them to and fro, multiplies the chances of the union of the fracture. For nearly similar reasons Desault exposed their defects, introduced it in the History, and the success which he experienced from this practice contributed materially to its more general adoption.

Desault, as we have stated, preferred the straight posture, and laid his patients on surfaces and beds in work with the weight of the body. The latter policy, formerly in common use at the Hôtel-Dieu, had this inconvenience. For those, in cases of fractures, Desault substituted a firm, curvilinear band, which did not allow the continual change of position to occur which a soft bed does. The object of every apparatus being to keep the ends of the fracture from being displaced, the mechanism of every contrivance for this purpose should be directed against the causes of the displacement. These are, 1, the action of the muscles drawing upwards the lower end of the fracture; 2, the weight of the trunk propelling downwards the upper

end. Hence, every apparatus invented to prevent displacement of a thigh fractured obliquely, should, 1. draw and keep downwards the lower end of the fracture; 2. vary and maintain upwards the upper end of the fracture, and the trunk which is above it. This principle is of general application, and only subject to a few exceptions in transverse fractures, attended merely with displacement in the direction of the diameter of the limb, or none at all. 3. There must also be the apparatus to preserve to the position of the lower portion of the broken bone, so as to keep the limb steady, even in case of any sudden motion.

If we compare the operation of the different pieces of our apparatus with the above indications, Desault says, we shall find that without permanent extension they are not very efficient. With regard to bandages, whether a roller or eighteen-tailed bandage be used, they all have one common mode of operating; they press the muscles towards the ends of the fracture, so as to make them form a kind of internal case for the fracture, and thus they make lateral resistance against the parts. In this matter, bandages essentially fail in preventing displacement sideways, and are particularly ineffectual in transverse fractures. But what is there, to hinder the two united surfaces of an oblique fracture from slipping one over the other? When power is there to keep the limb from receiving the effects of accidents which? Is the pelvis kept back? Is the action of the muscles resisted? The latter is indeed somewhat diminished by the pressure, and this is the chief use of the bandage; but, with such compression, is enough to prevent the longitudinal displacement of the broken bone, especially if the bandage be applied strictly as we have said.

These remarks apply also to compresses, *petits moyens* create une grande cause.

Spitals are useful in firmly fixing the limb, and guarding it from the effects of accidental shocks, or of contusions of the splinters. They operate more powerfully than bandages, in preventing lateral displacement; and hence they suffice for transverse fractures, without permanent extension. They also resist the motion of the thigh towards the knee. But when the knee itself constantly is oblique, will they hinder the ends of the bone from sliding over each other, and the consequent shortening of the limb? They obviously could only be so by the friction of the different pieces of the apparatus, especially the tapes, which serve it; and then, to render the resistance efficient, they must be tied so tightly as to create danger of mortification. Will the splints prevent the trunk from descending, and protruding before it the upper end of the fracture? Will they hinder the action of the muscles on the lower end? Will they, in short, fulfil all the above indications? Their chief use is to prevent lateral displacement, and keep the limb steady. Hence, they should extend along the leg as well as the thigh, which is what I have observed whenever the lower part of the limb is affected by force.

The main service principally to keep the limb from being pulled by the splints, and their action in preventing displacement of the fracture must be not trivial.

According to Desault, the ordinary pieces of apparatus, when, as we examine any permanent extension, may suffice for transverse fractures; but they are always insufficient when the fracture is oblique, because they do not fulfil the essential indication of drawing downwards the lower end of the fracture, and keeping the other end steady.

He intended that the object principally to be aimed at was with a suspension, that the foot, leg, thigh, and pelvis should be suspended one above the other, so that, though the different parts thereof might be drawn in different directions, yet they would sit, with respect to one another, preserve the same natural relation. He intended the following apparatus to answer these purposes.

A strong solid, long enough to extend from the roots of the os ischii to a certain length beyond the sole of the foot, and rather more than two inches and a half broad, with such an os extension as to form the form of a pelvis, and terminating in a rectangular table, is a principal part of Desault's apparatus. It is applied to the external side of the thigh, by means of two strong linen straps, each fixed to a pin on the

The middle part of one table is to be raised to the middle of the thigh, so as to support (that) as ends are

brought to the smaller side of the thigh, passed through the middle, and knotted on the anterior side. Bands are to be previously placed under the middle part, in order to prevent any dangerous pressure; as well as on the tuberosity of the ischium, which Desault considered as the principal point of action of this band. The inferior part of the leg is next covered with pads, so that the middle part of the second roller is placed, the extremities of which cross on the inner and upper part of the foot, then on the sole, after which they are covered outwardly, and are each passed through the middle, and knotted with one other on the right, with such a degree of force as to put the inferior portion of the femur downwards, and push the splint upwards, and, by this means, the pelvis and superior portion of the fractured bone. On the internal side of the limb is placed a second splint, which extends from the superior part of the thigh to a certain distance beyond the foot. A third is placed on the anterior part of the limb from the ankle to the knee. The superior extremities of the anterior and exterior splints are fixed by means of a bandage passed round the pelvis. A roller, the middle part of which is placed under the sole of the foot, and the extremities crossed on its superior surface, and fastened to the splints, operates with them in preventing the foot from moving.

Before applying the apparatus, Desault covered the whole limb with compresses, wet with a solution of the acetate of lead. Over these Desault's bandage was put, and a roller round the foot, all wet with the same lotion. For more particulars the reader is referred to the *Parvum Chirurgicum*, vol. 1. *Quæstio* Chir. de Desault, per Boerhaave, J. L. Boerhaave, *Methodus* de Fractura, in *opere* Medico-chirurgico all' Apparatto di Desault, &c. Palermo, 1814. *Boerhaave*, *Trattato della Fractura*, &c. 2. 3. *Ridderstedt*, *Novæ*, Chir. 1. 3. and 4. Boerhaave's apparatus for fractured thighs is described in the last edition of the *First Lines of the Practice of Surgery*.

Instead of the position advised by Desault, we have recommended by Desault and Boerhaave, Dr. C. Hall prefers the posture in which the patient lies upon his back, with the limb supported in the best position by means of a wooden frame. This machine is simple enough, consisting of boards ten or eleven inches in breadth, six inches from the heel to the knee, the other from the knee to the inferiority of the ischium. Upon the knee of it they are united at its angle, where a horizontal board connects their lower ends together. Thus they form two sloping surfaces, to which distally they slant, and lower which the limb can be placed in an easy bent position. Near the edge of the inclined boards, holes are made perforated with pins. After the foot has been set, a line splint is applied, from the hip to the sole of the knee, and another along the inside of the thigh. See *Operative Surgery*, vol. 1. p. 103. I consider a very tolerable substitute of this mode of placing inclined splints. However, the foregoing apparatus does not sufficiently secure the leg and foot from motion, though, with the aid of a roller and a foot board, this advantage might easily be obtained. The fracture-splints, devised by me from Mr. Hall, is essentially calculated for five modes of treatment, with some additional recommendations, that the obliquity of the two surfaces on which the limb reposes can be altered at occasion most proper;—there is a foot-board for the support of the foot, and a contrivance by which the patient is enabled to have access without moving himself or changing his posture in the slightest degree. (See his *Practical Observations in Surgery*, p. 115, &c. New-Land, 1825.)

Fractures of the Neck of the Thigh Bone.

As this is a subject which has of late years excited considerable discussion, the reader cannot be too particular in ascertaining that three distinct kinds of fracture, very different in their nature, treatment, and result have been generally confounded together under the name of a fracture of the neck of the thighbone; for much of the dispute that has prevailed, whether these fractures will unite like those of other bones, seems to have proceeded from this false opinion of fracture not having been properly distinguished. Two of the kinds will by means of nature, lose their fractures; but the other, as it usually occurs, is attended by some exposure not so distant of a similar case of union; or, at all events, they declare that the cure has

and, as Camper has remarked, it is mostly only an effect of the force of the muscles, the line of gravity of the body as, by contraction of another, inclined backwards; the tendons at first contract to bring it forwards again, the tendons act on the patella; the breaks and the fall ensues. That it is the effect of the action and not the fall which merely breaks the tibia, is well ascertained. Sometimes the fracture occurs, though the patient completely succeeds in preventing himself from falling backwards, as we first experienced in two cases reported by Sir A. Cooper. (*Surgical Essays*, part 2, p. 351.) A soldier broke his patella in endeavouring to kick his opponent; the operation has been broken in throwing a stone. In the operating theatre of the Hôtel Dieu, both the knee-joint of a patient were broken by the violent spasms of the muscles, which followed an operation for the bone. The force of the muscles occasionally ruptures the external tendon of the anterior muscles, or, what is more frequent, the ligament of the patella. Of these cases, Pott, Blandin, and Sabatier met with examples. When the patella is broken lengthily, the case is always outwardly valuable. (*Illustra. Chir. de Desault*, t. 1, p. 283.)

A transverse fracture of the patella may also originate from a blow or fall on the patella; but in common cases it is produced by the violent action of the extensor muscles of the leg. It is only of late years, however, that the true mode in which the bone is usually broken has been ascertained. As Boyer observes, for the production of a transverse fracture of the bone, the extensor muscles of the leg need not act with a convulsive force, their ordinary action being strong enough to produce the effect; in question which the body is inclined backwards, and the patient is in danger of falling upon his occiput. In this state, the thigh being bent, the extensor tendons of the leg give their powerful, in order to bring the body forward and prevent the fall backwards; and the patella, whose posterior surface thus rests only by a point against the knee part of the condyles of the femur, is placed between the resistance of the ligament binding it to the skin, and the action of the extensor muscles. A fracture now happens the more easily, because, by the tension of the knee, the line of the extensor muscles and that of the ligament of the patella are rendered oblique, with respect to the vertical axis of the bone, which is bent backwards at the point where it rests upon the condyles. (*Traité des Mal. Chir.* t. 2, p. 322. *C. Bell's Operative Surgery*, vol. 2, p. 255, *Ann. Lond.* 1809. *A. Cooper's Surgical Essays*, part 2, p. 283.) By violent spasmodic action of the extensor muscles, however, the patella may be broken conversely, which the limb is possibly straight. A very singular case is mentioned by Sir A. Cooper, where a patella, which had been formerly broken and mended by ligature, was again divided into two portions, in consequence of the destruction of the mending medium by absorption. (*Phil. Mag.* p. 1805.) A case is also on record, where the ligamentous stuffing introduced was so incorporated with the skin, that when the latter happened to be incised, the knee-joint was laid open, and suppuration became necessary. (*Ed. Ann. of Surgery*, vol. 2, p. 231.)

In transverse fractures, there is a considerable separation between the two fragments of the bone, very perceptible to the finger when the hand is placed on the knee. The separation is not accompanied equally by both portions; the upper one, elevated by the extensor tendons, is drawn upwards very forcibly by these powers, which the patella no longer resists; while the inferior portion, being firmly connected with the ligament below, is not moved by any force, and can only be displaced by the tension of the leg to which it is attached. Hence the separation is least when the limb is extended, being then only produced by the upper fragment; greater when the thigh is bent, because both powers contribute to it; and it may be increased or diminished by bending the knee more or less.

As Boyer has particularly noticed, the deviation of one of the fragments exposes the end of the patella, making a material difference in these cases, because it is a part of great importance in the cure. According to this author, a portion of it is simple because of the patella generally causes laceration, and the separation of the fragments is thus not very considerable; but

violent action of the extensor muscles, the fall subsequent to the fracture or bending of the knee too much, may separate two pieces of bone far from each other, and rupture the ligaments expressively. (*Traité des Mal. Chir.* t. 2, p. 283.) According to Sir A. Cooper, "when the ligament is benighted, the separation will be at half an inch; but under great extension of the knee, the bone is drawn six inches upwards, the capsular ligament and tendons of the muscles covering it being then greatly lacerated." (*Surgical Essays*, part 2, p. 351.)

The upper portion of bone may be moved transverse, and pain is thus excited, but no erysipelas can be felt, as the two pieces of bone are not sufficiently near each other. When the swelling of the knee, consequent to fracture of the patella, is very great, the symptoms of the injury may be some or less obscure. However, in consequence of the mobility of the extensor tendons to move the leg, except in a few cases where the fracture is very low, the patient cannot stand without difficulty, and is unable to walk.

In the treatment, the chief indications are to overcome the action of the extensor muscles of the leg, and to keep the fragments as near each other as possible, partly by a judicious position of the limb, and partly by mechanical means. The first indication is fulfilled by raising the above-mentioned position; 2d, by extending the leg. 3d, by bending the thigh on the pelvis, or, in other words, raising the femur, so that the distance between the knee and anterior superior iliac spine of the femur may be as little as possible; which object, however, will not regulate the body to be raised, and the person somewhat inclined forwards. At first, as the knee is not so adjusted, the patient should be placed in a sitting posture, the trunk leaning a right angle with the thigh. (*Ed. Ann.* t. 2, p. 316, *Illustra. Chir.* 1793.) 3dly, The tendons are to be compressed with a roller. The second indication, or that of placing and moving the fragments in contact, or as nearly as circumstances will allow, is a great measure already answered by the above-recommended position of the limb and thigh; but it is not perfectly fulfilled, since the upper portion of the bone is also pressed towards the lower fragment, and mechanically held in this situation by the pressure of an apparatus of bandage. And, in pushing the upper fragment towards the lower one, the surgeon should always be careful that the skin be not displaced and pinched between them.

Having described the principles which ought to be observed, I do not know that any great ability would result from a detail of the various methods of treating a broken patella, preferred by different surgeons. In the last edition of *the First Lectures of Surgery* may be found a description of the plan and apparatus employed by James Boyer. Desault's practice, which was related in the third edition of the Dictionary, I now deem as not being exactly such as modern surgeons would wish; not more any of his principles being erroneous, but because his apparatus is more complicated than necessary.

After putting the patient to bed upon a mattress, and in the desirable posture, with the limb confined, supported, and raised, as above directed, upon a well padded hollow splint, Sir A. Cooper applies at first no bandage to the knee, but covers it with linen wet with a lotion composed of the spirits of rose, tinct. 3v and water, viz. 7j. If on the succeeding day or two, there be much tension or erythema, leeches should be applied, and the dress continued; but the employment of a leech is not to be continued until the tension has subsided; for Sir A. Cooper asserts to that he has seen the greatest swelling, and such swelling as threatened gangrene, produced in these cases by the too early use of a roller. Instead of a circular bandage, placed above and below, the bandages, he said, drawn together with tape, &c., so as to bring the upper fragment downwards the lower one, thus exposed the suppurative process the following method. A leather strap is buckled round the thigh, above the broken and elevated portion of bone, and fixed this circular piece of leather another strap passes under the middle of the foot, the leg being extended, and the foot considerably raised. This strap is brought up to each side of the patella, and included in the leather band already applied to the lower part of the thigh. It may also be fastened to the skin at any part of the leg with tapes. The Ka. is

to be confined in this position five weeks if the patient be an adult, and six if advanced in years. Then a slight passive motion is to be begun, and to be partly insisted from day to day, until the flexion of the knee is complete.—(*Surgical Essays*, part 2, p. 91.) But, although the propriety of making any constriction of the knee with a bandage, when the skin is excited and inflamed, must be obvious, the surgeon might be supposed that such swelling and inflammation could not be avoided the best way is to place the limb in the right position, and pressing the upper fragment towards the lower one. Malmström ascribes the same error to many as frequent after this fracture, partly to the custom of not flexing or straightening the joint at once together with the swelling and redness, and partly to the fashion of bandaging the joint too tight, with a view of preventing its motion. But, says he, nothing can be clearer than that it is most advantageous to attend to the nature of the fracture first, and to the facility of the joint afterwards.—(*Recherches*, t. 2, p. 285, [1832.] Bone has likewise remarked, that the healing substance is apt to yield, and become loosened, by bending the limb too early, and he therefore never allows this motion to be performed before the end of two months. When the transverse substance is long, and the patient very slow in acquiring the use of the extremity, however, no should sit every day on a table, and endeavor to bring them into action, and as this increases, a weight may be added to the foot, as Hunter, Shelden, &c. recommend.

Nothing keeps the leg more firmly supported than a long, broad, even-sided splint, with a suitable pad, applied to the posterior part of the thigh and leg, and fixed there with a roller, while the limb itself is to be bent by raising the whole limb, from the foot to the top of the thigh, with pulleys, with, of course, great care a gradual ascent from the inferiority of the fracture to the foot.

The broken patella is seldom always united by means of a ligamentous substance, instead of bone.

Hunter, that an osseous union may follow a transverse fracture of the patella, and still more frequently a purpus is also one, but that in which there is not now the slightest doubt. Thus, I observed four patients in an unequalled specimen of a transverse fracture, united by bone, with the history of the case, and the appearance after the death of the patient from some other affection.—(*Boyer, Traité des Mal. Chir.*, t. 2, p. 255, &c.) In the collection of Dr. Williams Hagner, there is one well-marked instance of the bony union of a transverse fracture of the patella, and other examples have been seen in the last subject by Mr. Wilson.—(*On the Structure, Physiology, &c. of the Skeleton*, p. 248.) In Mr. Charles Bell's museum may also be seen similar specimens.—(*On Anatomy of the Spine and Thigh-bone*, p. 57, 58.) The reason why transverse fractures of the patella do not commonly unite by callus, is not owing to the want of power in this bone to produce an osseous connecting substance; for, as Lorry has several times noticed, if the fragments are kept in perfect contact by means of a suitable apparatus, their bony union becomes so complete, that scarcely any vestige of the injury can afterward be traced.—(*Journ. Chirurgical*, t. 8, p. 114.) Indeed, it is a fact, on which Lorry dwells as affording a proof that callus is produced, not by the pressure, but by the weight of the bones themselves. And what must add strength to the purport of the foregoing remarks is the consideration, that physiochemical or imputed fractures of the patella, which are not liable to any displacement from the action of the extraneous muscles of the leg, readily unite by bony union.—(*Histories of the Structure and Physiology*, &c. of the Skeleton, p. 325.) These a statement which, I think, could not be rendered doubtful by any experiments made on animals, without the advantages of epistaxis and proper treatment. Yes, there are other facts related, which prove that, both in longitudinal and transverse fractures, a ligamentous union is generally produced, when the fragments are separated; but if these are not drawn asunder, no osseous union takes place. Thus, in one case reported by Mr. A. Cooper, one-third of the patella was separated from the rest of this bone, and laid asunder by ligatures, a free motion being left between the fragments.—(*Surgical Essays*, part 2, p. 94.) The same gentleman dividing the patella longitudinally in a dog, without extending the division into the tendon above, or the

ligament below, so that the fragments could not be separated. In three weeks a close bony union was the result.—(*J. 50*.) A case is also related, in which a professor fractured the patella transversely, and the lower portion likewise perpendicularly. The transverse fracture united as usual by ligament; the perpendicularly one to bone.—(*J. 50*.) Mr. Charles Bell gives another explanation of the cause of union being by bone or ligament. In the common case, says he, if fracture of the patella by the sudden action of the knee (knee extension), the pieces are separated without the degree of violence which is necessary to produce division by bone. But when the patella is broken by a blow or kick, there is not only long extension, but also injury, mostly effusion, excoriation, and injury of the parts remote from which the violence has been applied, and the fragments are by force.—(*On the Structure of the Spine*, &c. p. 285.)

Theophrastus became formerly extremely respecting the transference of an elevation and protrusion of the collar into the joint after a fracture of the patella, and especially when the fragments are kept in contact, were long ascribed by Pott and Mead.—(*Pract. Chir. Works*, vol. 1, p. 252, ed. of 1788. And Don's Essay on the Fractures of the Patella, &c. 2nd. Lond. 1789.) On the contrary, as Mr. A. Cooper particularly remarks, "the internal articular surface of the bone preserves its natural smoothness."—(*Pract. Chir.*, &c.) How much doctrine of a separation of the articular surfaces with the difficulty of extension must have ever possible, appears difficult of explanation.

Pott, and some others, thought that there must necessarily an interference afterward, but from the two pieces of the patella, with a certain length of the connecting substance, might be advantageous in the nature of the union. But Boerhaave, Boyer, Mr. A. Cooper, Mr. J. Ellis, and others, have always stated that the greater the distance between the two pieces of the bone, the greater the difficulty afterward in making up a union of it with an equal good result.

In the treatment of a longitudinal or perpendicular fracture of the patella, the leg should be kept extended, without swell, and a cold lotion applied. After a few days a splint is to be put round the limb, and then a bandage with strong buckles, passing the limb above and below the patella.—(*A. Cooper*, vol. 2, p. 183.) Theophrastus of Hippocrates explains the fact, that a longitudinal fracture of the patella is soon firmly united.—(*Antiquary Med. Chir. de Paris*, p. 94, the *Journal*, 1820.) Consistent fractures of the patella are especially common in the death of the patient, unless perhaps he dies early. The injury, however, is not invariably fatal, owing to the loss of life in kind. I saw a case in St. Bartholomew's Hospital, in the year 1820, under Mr. Vissers, where the patella was broken to pieces, and the opening so extensive that the finger readily passed into the joint; yet, after a tedious suppuration, the formation of abscesses, and the removal of several fragments of bone, the patient recovered with a stiff joint. In general, however, I believe, with Mr. A. Cooper, that in compound fractures of the patella if the laceration be extensive, or the distention very considerable, amputation will be required; but if the wound be small, the patient not irritable, and no suppuration of the instruments or ligamentous tissue, it will be best to try to save the limb.—(*Vol. 2*, p. 28.) The wound should be dressed as usually in position, and advantage taken of coagulating eschar, perfect rest in a desirable position, a very low temperature, respiration, and gentle cooling medicine. Some writers the above remarks I have with another case of bad compound fracture of the patella in St. Bartholomew's Hospital, where it has been about a month. No fragments of bone have yet been removed, but a good deal of matter issues daily from the wound. The case must be regarded as a very promising one, though if bony union should not follow the joint will not, the limb will probably be saved.

In addition to the words already cited, several R. H. Malmström de Patella Bone, *opuscule* Lundska af Chirurgen, Printed. 1837. 25 Cooper, *Don's Fractures of the Patella*, &c. 2nd. Edges. Lond. 1789. Boyer in *Chir. Chém.*, t. 1, p. 14. T. Adams in *Trans. of the Associated Apothecaries*, &c. vol. 1.

FRACTURES OF THE LEG.

May be transverse or oblique. The first case is of

leged to be most common in children. Experience shows that the two bones of the leg are usually fractured together rather than single; a fact ascribed by Boyer to the strength of the knee and ankle-joints. — (*Threats to the Life*, Chap. 2, § 2, p. 202.) The direction of oblique fractures of the tibia is stated to be pretty constantly from below upwards, and from within outwards, the end of the upper fragment usually protruding itself under the skin at the inner and lower part of the leg. In these cases, the longitudinal displacement of the fracture is less common than the transversal and oblique. However, when it does happen, the inferior fragments are driven upwards and forwards, while the superior ones protrude externally and backwards. The angular displacement may be produced indirectly, the action of the superior muscles of the leg, or the weight of the distal end is bent upon the axis, projects backwards. But injury is almost invariably, if the bone is too much raised. A rotary displacement, most commonly by pressure in the direction outwards, is produced by the motion of the foot, and if this be raised too much upwards, the rotary displacement will be in that direction. A longitudinal displacement cannot take place in transverse fractures, on account of the complete union of the surfaces of bone; but in oblique fractures, the inferior fragments are almost always driven upwards by the action of the posterior muscles of the leg, in which position of the parts the lower ends of the superior fragments project forwards, and may be felt by the hand. Sometimes, however, when the motion of continuity is upwards downwards and outwards, the inferior portion will be produced by the lower pieces. In both kinds of displacements, the pointed ends of the pieces will bear and penetrate the integuments, and cause a compound fracture.

The usual symptoms denoting a fracture of both bones of the leg are, a change in the direction and shape of the limb, pain, and impossibility of walking, or bearing upon the limb, swelling of the fractured pieces, and a distinct crepitus.

Fractures near the knee are not very subject to displacement, on account of the thickness of the tibia in that part; but they are more dangerous than those of the middle of the bone, because often followed by inflammation of the knee-joint. Fractures close to the ankle are still more dangerous. Oblique fractures are very difficult to maintain, and when their displacement is upwards and forwards, the integuments are in danger of being torn by the protruding points of the superior portion of the tibia. — (*Nagel*.) It had been supposed that the leg most of the observations are applicable already defined on compound fractures is general.

When the site of the tibia is compared with that of the fibula, and the same symptoms of these bones to each other is remembered, an opinion might be formed, that the first could serve to break without the second. Experience, however, proves the contrary. And reasons for this fact, as Boyer remarks, may be deduced from the consideration that the tibia is the bone which supports the weight of the body, and that it is situated at the fore part of the limb, simply covered by the skin and flesh exposed to the effects of violence. — (*Threats to the Life*, Chap. 2, § 2, p. 203.) When the tibia alone is broken, the fracture is said to be generally transverse.

If the injury happens near the knee, the great extent of the frontal surface prevents any considerable displacement of the fragments; and the fibula, acting as a support to the external side, contributes also to this effect. But, however, has been one instance in which the tibia was broken by the kick of a horse, and the fragments, driven in the direction of the axis of the bone, when displacement could not be resisted, so that the bone remained protruding at the part.

The absence of displacement often renders the diagnosis of fracture of the tibia very difficult, and the difficulty is further increased by the little pain and inflammation produced by such a fracture, with which persons have been known even to walk.

Whenever there is reason to suspect the accident, in consequence of a blow or a fall on the leg, the part should be carefully examined. The fingers are to be moved along the anterior side of the tibia, the slightest irregularity in which may be easily perceived, on account of the being covered only by the skin; and the motion of the joint may be distinguished by grasping the opposite ends of the bone, and pulling them in vari-

ous directions. However, this motion and the steps are not always very plain, on account of the fibula not allowing the fractured portions to be sufficiently moved in one position.

In a review of the position and strength of the two bones of the leg, it will appear that the tibia supports above the whole weight of the body, every shock directed in the axis of the limb, and every kind of force applied also in the transverse direction, without operating upon any particular point. Hence the frequency of fractures of the tibia; and if the fibula is general, broken at the same time, the latter injury is less extensive to the tibia, and takes place lower. This structure is not capable of bearing the weight of the body, the impulse of external violence, and even the action of the muscles, after the tibia has given way. — (*Deputen*, *Annuaire Med. Chir. des Hôpitaux de Paris*, p. 15, 4to Paris, 1815.) On the other hand, as the same distinguished surgeon remarks, the fibula being principally designed as a support for the inside of the leg, it is particularly when the tibia is to be extended, and its lower end has to make resistance to all sorts made by that direction, that it is fractured; and if the lower part of the tibia be also sometimes broken by the same force, it is almost always comminuted, and not by the effect of a direct and instantaneous action upon the two bones. — (*P. 17*.) All fractures of the fibula, however, are not caused in the preceding manner; and Deputen concurs with Boyer, Mr. C. Bell, and all the best writers on this subject, in dividing these cases into two kinds: first, those in which the force is applied directly to the bone itself, secondly, the more important and serious cases, in which the force operates upon the fibula, through the medium of the foot. With respect to the first class of cases, the situation of the fibula on the outer side of the leg, a situation which would seem to expose it much to external violence; its slenderness; the advantage left between it and the tibia at the middle part of the leg; and the way in which each end of it runs upon the lower bone; would lead one to expect that its middle portion must often be broken; yet the case is less frequent than might be supposed. And, as Deputen observes, there are two reasons for this fact; viz. the protection which the fibula receives from the peroneus muscles, and the rarity of protrusion capable of producing a fracture by a direct cause. These fractures, which are not usually attended with difficulty, and in some cases even do not hinder the patient from leaning upon the foot, caused for the most part to be mortified, unless attention be paid to the manner in which the accident was produced, and to the presence of ecchymosis, and of some or less pain in the part which has been struck, or pressed upon; together with a degree of irregularity of the limb, perceptible by the finger, and a more or less distinct swelling and crepitus of the ends of the bone.

The usual causes of this sort of fracture are blows on the fibula, gun-shot wounds, the fall of heavy bodies on the outside of the leg, or the pressure of them over the same part. The fact is generally twofold, either upwards or outwards; and is most instances the accident is easily cured by means of rest, without being accompanied by any of the symptoms so often complicating other fractures of the fibula, produced by extension of the foot. — (*Nagel*, *op. cit.* p. 181.) A similar analogy may be remarked between fractures of the external part of the fibula and those of the corresponding portion of the tibia, and thus in respect to nature, symptoms, treatment, and consequences. Fractures of the middle of the tibia like those of the body of the fibula, are always accompanied by blows or falls on the fractured part, or by violence applied directly to the bone. Such fractures are scarcely ever attended with any difficulty in the limb, incapacity of moving it, or displacement of the fragments; and just as some individuals are able to walk with a broken fibula, others, notwithstanding a fracture of the tibia, are found capable of using their limbs nearly as well as if a severe blow from injury. The latter case, like that of a fracture of the fibula, can only be ascribed to the resolution of the bone in which the hurt was received, the pain, ecchymosis, irregularity, motion, and crepitus, which last effects are also not very obvious so high up the bone. Like fractures of the body of the fibula, those of the body of the tibia only require rest and the usual applications, and very seldom the bandage, as the

nary is the treatment of fractures of both bones of the forearm, or of those of the radius alone.—(Vol. vii. p. 58.)

Fractures of the shafts from an external cause may happen from the foot being violently thrust either inwards or outwards. In both instances the cause of the fracture is a change in the direction of the line in which the weight of the body is transmitted. In the first case, the axis of the tibia, and falling upon the astragalus, crosses the lower end of the tibia and the suppling, obliquely from within outwards, and after passing across the malleolus externus, extends to the outside of the os calcis. The parts then supporting the weight of the body are the suppling situation and the lower end of the tibia; besides which state of parts, the same malleolus is subjected to the action of the external lateral ligaments, which, spending with great force, in consequence of those ligaments being torn, nearly at a right angle with the lower end of the tibia, while this process itself is in contact with the astragalus, which is projected from within outwards by the tibia. The latter bone, being thicker and stronger than the shaft, generally remains; and if the malleolus internus sometimes happens to break, it is secondarily, as an effect of the displacement of the foot outwards.

In the other example, where the foot is twisted outwards, the centre of gravity of the body, instead of following its usual course, obliquely crosses the lower end of the tibia, the astragalus, and the malleolus internus, and falls on the ground at a greater or less distance from the inner edge of the foot.—On the one side, the internal lateral ligaments and malleolus, and on the other, the lower end of the tibia, are then the parts which have to bear the weight of the whole body and the force of the tension; and they are also the parts which are torn and fractured. First, the internal lateral ligaments, or the malleolus; and, secondly, the lower portion of the tibia.—(Anatomy of the Human Body, 1818, p. 65, 67.) Some of the symptoms of a fracture of the tibia, from an indirect cause, depend upon the fracture of that bone, and others upon the dislocation of the foot. They are divided by Dupuytren into two kinds: viz. *presumptive* and *characteristic*. The first are, the way in which the patient received his hurt; a noise or sort of crack heard by him at the instant of the injury; a fixed pain at the lower part of the tibia; a difficulty or inability of walking; some or less swelling round the ankle, especially about the malleolus externus and lower portion of the tibia. The characteristic symptoms are, an irregularity and unusual morbidness of some point of the lower end of the tibia; a swelling, which can be more or less distinctly felt by pressing upon and moving the part; mobility of the whole foot transversely or horizontally; a facility of bending the lower end of the tibia towards the tibia by pressure; a change in the point of incidence of the axis of the limb upon the foot; distortion of the foot outwards, and sometimes backwards; relaxation of the lower part upon the axis from within outwards; an angular depression, more or less manifest, at the outer and lower part of the leg; projection of the internal malleolus; disappearance of almost all these symptoms, as soon as reduction is effected by a force applied to the foot; and their immediate recurrence when such force is discontinued, particularly if the limb be in the extended posture.—(Vol. vii. p. 65.)

In considering the varieties of simple fracture of the tibia, the first to which Dupuytren adverts is that in which the bone is broken more than three inches above the articulation of the malleolus externus; a case neither complicated nor followed by any displacement of the foot, and almost always prepared by the direct application of violence to the broken part of the bone.

A second variety of simple fracture of the tibia is when the bone has been broken, either by direct or indirect force, within three inches from the end of the malleolus externus, and when the foot is not displaced, though much displacement is possible, and, indeed, often arises from the slightest effort to retract the part by the patient. The most frequent point of injury is about two inches and a half above the extremity of the lower malleolus. This is generally the place of a fracture caused by a blow of the foot outwards; but the accident may happen lower down, as is commonly

seen, when the fracture is occasioned by a blow of the foot inwards.

These fractures of the tibia, abstractedly viewed, are not of much importance in themselves; but with reference to the manner in which they facilitate the dislocation of the foot, they are very serious.

Among the most frequent complications of fractures of the tibia, are the rupture of the internal lateral ligaments, the detachment of the point of the lower malleolus, and fracture of the lower part of the tibia. When these lesions originate from a violent blow of the foot outwards, they precede the fracture of the tibia; but when they are caused by a blow inwards, they follow the breaking of that bone.—(Dupuytren, *op. cit.* p. 66.)

Besides distortion of the foot outwards or inwards, an attending certain dislocation of the tibia, another complication may be dislocation of the two tarsals, produced by the action of the muscles of the foot and not by the same causes which broke the bone. However, whenever the malleolus internus has not given way, the dislocation is incomplete, and the foot is displaced outwards as well as backwards. In the complete dislocation, as Dupuytren remarks, the foot presents a fixed invariably anteroposterior, though in a state that it will not always answer in maintaining the reduction.

TREATMENT OF FRACTURES OF THE TIBIA.

As in most of fractured thighs, the position may almost either a bent or a straight position of the limb. In this country, surgeons mostly follow Mr. Pott's advice, and select the first one, of which name I shall treat. That the best position is, generally speaking, the most advantageous for a broken leg, I am well convinced. The strong muscles of the calf of the leg are the powers which tend to displace the ends of the tibia, and their relaxation is a thing of the first consequence. It is quite different in the thigh, where the muscles are so numerous, that the strength tends, by any position of the limb, almost to have the point of displacing the fragments, would be in vain. I am ready to acknowledge, however, that in the best position the apparatus is delicate, and much to a limb and keep the knee-joint loose, but in a certain case, such motion has not so serious an effect upon fractures of the leg as it has upon those of the thigh. When the case is complicated with a wound, which cannot be dressed in the best position of the limb, without great disturbance of the patient, the straight position might happen to be preferred. With respect to one of Mr. Pott's objections to the position, viz. that it makes the knee stiff for a long while afterwards, I suspect that we should not lay too much stress upon the circumstance; because, as I have already observed, it is always the joint nearest below the fracture that is thus affected.

In the fracture of the tibia only (says Pott) the position is not of much consequence; because, as the tibia remains entire, the fibres of the leg are preserved, and continue quite uncontracted; but still, even here, the laying the leg on its side instead of on the end, is attended with one very good consequence, viz. that the confinement of the knee, in a moderately bent position, does not render it so irremediably flexed and stiff as when the straight or extended position of it does; and consequently, that the patient will be much sooner able to walk whose leg has been kept in the latter position, than he whose leg has been confined to the latter.

In the fracture of both tibia and fibula, the knee should be moderately bent, the thigh, both, and leg lying in the same position as in the former thigh. If extension appears to be used, one should be placed underneath the leg, extending from above the knee to below the ankle, the foot being properly supported by pillows, bolsters, &c., and another spinal of the same length should be placed on the upper side, compressing both joints in the same manner; which disposition of supports might always to be observed, so as that length, if the leg be laid extended in the common way, only changing the central position of them, as the pressure of the leg is changed, and calling what is inferior in one case exterior in the other; and what is superior in one, in the other inferior.

If Mr. Risbrough's splines be made use of, there is nothing of them a provision for the same easy support of the knee and ankle, by an apparatus in, and a principle

tain of the lower or tibial splint, for the purpose of keeping the foot steady."—(Pott.)

The strong muscles of the leg being relaxed by placing the limb in the best position, as advised by Pott, the surgeon is to make such extension as seems necessary for bringing the ends of the fracture into even apposition. Then he is carefully to raise the leg a little way from the surface of the bed, by taking freely hold of the limb above and below the fracture, and elevating the broken bones together in such a way as shall keep both the upper and lower portions as nearly as possible on the same level. As this cannot all be sustained should put exactly beneath the leg the under splint, which has been previously made ready by covering it with a soft pad, and laying over this an eagle-tailed bandage. The limb is now to be gently depressed till it rests on the apparatus. The surgeon, before proceeding further, must once more observe that the ends of the bones are evenly in contact. Being assured of this important point, he is to apply a piece of strip-plaster, and lay down the tube of the bandage. Another soft pad well filled with tow, is next to be put over the upper surface of the leg, and over that the other splint, when the straps are to be tightened.

Mr. Pott's method of treating fractures of the tibia is complemented with fixation of the tibia, as described in the article *Dislocation*, and Hagerup's practice in the last edition of the *First Lines of the Practice of Surgery*.

In an oblique fracture of the head of the tibia, extending into the knee-joint, Dr. A. Cooper recommends the straight position, in which the femur has the good effect of keeping the articular surfaces of the tibia firm. A roller is to be used for pressing one fragment towards the other; a plasterboard splint is also to be applied with the same view, and early passive motion of the joint is to be practiced in order to prevent ankylosis.

When the fracture is oblique, but does not reach into the joint, the same advice applies, placing the limb on the antero-internal plane.—(*Surgical Essays*, part 1, p. 302; and see *Dislocations*, &c. p. 225.)

FRACTURES OF THE SCAPULA.

As Boyer correctly observes, fractures of the scapula are not very common; a circumstance explicable by the deep and covered position of the greater part of this bone, and its great mobility. Nor are these accidents attended with considerably direct violence. However, there are some parts of the scapula, which, being more superficial, and of a form more likely to be acted upon by external bodies, are more frequently fractured: such are the acromion and anterior angle of the bone. Fractures of the coracoid process, and even of the neck of the scapula, are also mentioned; but the occurrence of such accidents are not common; and though these parts of the bone may appear at the shoulder, they do not often break, their deep situation in the bony subject generally saves them. Indeed, as Boyer says, they generally require great violence to break them, and then the cohesion of the soft parts is a worse injury than the fracture itself; thus, one author has seen the coracoid process broken by the blow of the point of a cleaver, and the patient lose his life from the violence at the same time inflicted upon all the soft parts about the shoulder.—(*Nouveaux Méthodes*, t. 2, p. 44.)

When the acromion is broken, the weight of the arm, and the contraction of the deltoid muscle, draw it downwards, while the trapezius and levator scapulae draw the rest of the bone upwards and backwards. The position of the injured shoulder is lost, and part of the attachment of the deltoid being broken off, the head of the os humeri tends towards the axilla, as far as the capsular ligament will permit. On tracing the movement from the apex of the scapula to the clavicle, the surgeon will find a depression just at their junction. The distance from the sternal end of the clavicle to the extremity of the shoulder is lessened. The natural form of the shoulder may be restored by raising the arm by the elbow; but the intensity requires immediately the arm is suffered to fall again. The axilla may be distinguished from a dislocation, if the surgeon upon the shoulder by passing the humerus upwards, when a creping will be perceptible to the surgeon's hand applied over the acromion, the arm being rotated.—(A. Cooper on *Dislocations*, &c. p. 45.)

When the lower angle is broken, the acromion major articulus draws it forwards, while the rest of the scapula remains in its natural situation; or if the angular portion be considerable, the trapezius, and some fibres of the latissimus dorsi, contribute to its displacement forwards and upwards.

When the coracoid process is fractured, the pectoralis major, coraco-brachialis, and short head of the biceps current in drawing it forwards and downwards.

When the neck of the scapula is fractured, the weight of the arm makes it drop down as considerably as to give the appearance of a dislocation; but the facility of lifting the arm fractis upwards, the creping, and the falling of the limb downwards again, immediately it is unsupported, are circumstances clearly marking that the case is not a dislocation. According to Dr. Hunter Cooper, the creping is best perceived through the medium of the external process. The degree in which the glenoid cavity and the head of the humerus descend, as observed, depends very much upon whether the ligament between the upper part of the spine of the scapula and the glenoid cavity is lacerated or not.—(See *Dislocations*, &c. p. 459.)

Sometimes great pain and a creping are experienced on moving the shoulder-joint after an accident; and yet the spine, the neck of the scapula, and all the above parts, are not broken. In this circumstance, it is to be suspected either that a small portion of the head of the os humeri, or a little piece of the glenoid cavity of the scapula, is broken off; which latter occurrence, I think, is not very uncommon.

When the inferior angle is broken the post-segment is extended, while the rest of the scapula is moved; and it is so arranged, that no mistake can be made.—(Boyer.)

Fractures of the spine and body of the bone are all attended with a creping; but in the first cases, an irregularity of the osseous part may possibly be felt.

The prognosis of fractures of the scapula varies according to the situation of the injury, and the attendant circumstances. Fractures of the body of the bone, whatever may be their direction, are generally very simple and readily cured. Those of the acromion and lower angle are more troublesome to keep right; but the most serious cases are fractures of the coracoid process and neck of the bone, which cannot be kept tight without great difficulty, and are said to be frequently followed by a considerable stiffness of the arm, tending to render it, in any way, and even paralysis. In other respects, the danger of fractures of the scapula depends less upon the situation of continuity at the bone, than the extension of the soft parts or injury of the thoracic viscera. However, when the fracture is comminuted and the splinters are forced into the subscapularis muscle, abscesses may form under the bone, and, according to Boyer, require a perforation to be made in it (*Med. Chir. t. 2, p. 365*), a proceeding which I cannot bring myself to think would ever be judicious, as making a penetrating opening in the soft parts must be the least possible. In military surgery the scapula is often injured by sabre-cut; but as Dr. Hunter remarks, this bone, when preserved from infection, is found in some cases to unite with great rapidity and without future inconvenience.—(*Principles of Military Surgery*, t. 2, vol. 2.)

According to Boyer, when the scapula is fractured longitudinally or transversely, it is merely necessary to fix the arm to the side by means of a bandage which includes the arm and trunk from the shoulder to the elbow. Thus the movement of the shoulder, which are only inconsistent with those of the arm, are prevented.

When the inferior angle is broken and drawn downwards and forwards by the acromion major articulus, the scapula must be pushed towards the humerus by inclining the arm itself upwards, downwards, and forwards, while it is to be kept with a roller. The humerus is also to be kept backwards as much as possible with compresses and a roller, and the arm is to be supported in a sling.

The fractured acromion requires the arm to be sustained that the head of the os humeri will push up the acromion, while an assistant pushes the scapula forwards and downwards in a contrary direction to that of the arm. To maintain this position, a circular bandage is to be applied round the arm and body.

Drawn tend to apply over a small pillow under the axilla before putting on the bandage, in order to make

the head of the os brachii project more upwards on bringing the arm out the side, but the Author Cooper thinks that a pillow on placed deep burns by throwing the head of the os brachii upwards, and widely separating the scapula from the spine of the scapula. He opposes the raising the elbow and keeping the arm fixed. He now retains the distal fracture by means of a medium put between the elbow and the side, the elbow keeping a little forwards; the limb is not to be brought to the chest in this position with a roller. The sides may have place by hand, but owing to the difficulty of maintaining the position, the writer recommends a permanent apparatus. — (A. Cooper on Bone Fractures, p. 455.)

When the external process is fractured, the bone is attached to it as to be relaxed by bringing the arm forwards towards the breast and keeping it there as a sling, while the shoulder is kept downwards and backwards, and a compress is placed just under the broken part with a roller.

The treatment of a fracture of the neck of the scapula consists in keeping the head of the os brachii upwards by means of a thick cushion in the axilla; in keeping the elbow bent and arm raised with a sling; and in preserving all motion of the arm by sliding it to the trunk with a roller. In case of these cases the apparatus proposed by Mr. Earle might be very useful. — (Pract. Med. in Surg. 1822.)

FRACTURES OF THE CLAVICLE.

This bone, being strong and slender, is supported at its ends, and protected externally only by the integument, is very often broken. In striving to keep the scapula at a proper distance from the scapula, and as a point of support for the os brachii, every degree of which recovery makes the fracture still more complete.

It may be broken at any part; but its middle, where the curvature is greatest, is most frequently the situation of the injury. It is not very often fractured at its extremity extremely. However, a direct force falling on the shoulder may break any part of the clavicle on which it immediately acts. The soft parts in this kind of case are also not so much injured.

A compressed fracture may be thus examined, and if the symptoms be very great, the subclavian vessels and nerves may be torn. The fall of a heavy body on the shoulder often gives rise to a paralysis of the arm.

When the fracture first is applied to the side of the bone, so as to fall on the point of the shoulder or on the humerus under the arm are extended, the clavicle may be very much bent, and fractured so obliquely, that the broken portions protrude through the skin.

Fractures of this bone are usually attended with displacement, except when the injury takes place at the scapular extremity and within the ligament, tying the clavicle and coracoid process together.

The external portion of the clavicle is always that which is displaced. The internal part cannot be moved out of its natural situation by reason of the costoclavicular ligament, and of its being drawn in opposite directions by the sternal-cleido-mastoid and posterior axillary muscles. The external portion, drawn down both by the weight of the arm and the action of the axillary muscles, and forwards and towards the pectoralis major, is carried under the external portion, which projects over it. The broken clavicle no longer keeping the shoulder at a due distance from the sternum, the arm falls forwards towards the breast. The position thus it is impossible to put the hand to the forehead because the arm is not so much in a horizontal position as the humerus necessary, which cannot be done while the arm has an arm power of support. The shoulder and upper extremity may be observed to be nearer the breast than that of the opposite side. The motion at the joints of bones on one another may be lost, as well as the projection of the end of the internal portion. When the shoulder is raised a crepitus may also be perceived; but this is productive of great pain, and the diagnosis is so obvious that it is quite unnecessary.

The ancient, and many modern, have supposed, that, in order to set a fracture of the clavicle, the shoulder must be drawn back, and fixed in that position. The patient was placed on a large stool, so that an assistant might put his knee between the shoulders, which he drew back at the same time with both hands, while the surgeon applied the bandage which was to keep the

parts in this position. But when the shoulders are thus drawn towards one another, the clavicle is necessarily pushed towards the sternum, and with it the external portion of the clavicle, which passes under the internal fragment.

The figure of a bandage has commonly been used for maintaining the parts in this position. While the shoulder keeps back the shoulder, as above described, the surgeon is to apply one end of a roller to the front of the side of the neck, and then apply a cross bandage to the opposite shoulder, round which it is to pass, and from that to the other shoulder, about which it is to be applied in the same manner, and afterwards repeatedly crossed before and behind. The tightness with which it is necessary to apply this bandage produces a great deal of excoriation about the axilla, and the effect is to make the ends of the fracture every inch nearer, the very thing which it is wished to avoid. Hence we think, that the true cross proposed by Hunter, as correctly described by Brander in the *Plan de l'Art de l'Art de l'Art*, and the roller strap recommended by Dupuytren, are very modifications of the figure of a bandage, and are not at all better.

Desault advised, however, to be made by means of the limb, which is applied with the modified bandage. This is done by converting the bandage into a loop, by carrying its lower end forwards, towards, and upwards, passing the shoulder back with a spiral and upwards, and putting a station to the upper end as a fulcrum.

Desault used to put in the axilla a bar of buckram, five or six inches long, and three inches and a quarter thick at its base. Two straps are stretched to the ends of the bar, which is placed upwards. They cross the back and breast, and are tied to the middle of the other arm. The cushion being thus placed in the axilla, and the bar in the hand, Desault used to take hold of the patient's elbow, and carry it forwards by means, and towards, pressing it slowly round the breast. By this motion, the fractured clavicle is drawn towards the sternum, the ends of the bones become situated opposite each other, and all difficulty is removed.

An assistant is to support the arm in this position, while the surgeon, taking a single-headed roller or one yard long, is to place one end of it in the axilla at the opposite side, and then apply the bandage with the upper part of the arm, and across the back to the same situation. The arm and trunk are to be carried with such circles of the roller, as far down as the elbow, drawing the bandage more tightly the lower it descends.

Compresses, dipped in camphorated spirit, are used to be placed along the fractured bone. Desault took a second roller, of the same length as the first, and put one end of it under the opposite axilla, where it was carried across the breast over the compress and fracture, then down behind the shoulder and arm, and after having passed under the elbow, directed to the breast. Desault next brought it across to the second shoulder, under and round which he laid it, for the purpose of fixing the first turn. He then crossed the roller across the back, brought it over the compresses, carried it down in front of the shoulder and arm, under the elbow, and obliquely behind the back to the axilla, where the application began. The same plan was repeated, until all the roller was spent. The apparatus was secured by pins, whenever they presented to be useful, and the patient's hand was kept in a sling.

Keyer has invented an apparatus for fractured clavicles, which is more simple than that proposed by Desault.

The cushion is to be applied under the arm. The apparatus consists of a grille of iron cloth, with passes round the trunk on a level with the elbow. It is fixed on by means of three straps and is many inches as an equal distance from the scapulae, the plates extending to each side two inches, two below and two behind the arm. The lower part of the arm is supported by a piece of quilted cloth, five or six inches broad. Four straps are attached to it, which are passed to the back of the outside of the grille, and serve both to keep the arm close to the trunk, and from turning the back towards or forwards.

Certainly, the methods proposed by Desault and Keyer are very judicious and scientific. They are, however, much adopted in this country, perhaps more

importance of the general exercises among English surgeons in every apparatus which is not especially contrived. It is to be feared, at the same time, that in the treatment of fractured clavicles, they will always attend to the particular which Desault and Boyer have mentioned. If they understood why the position of the arm should be such as those frequent fractures point out, they will have no difficulty in doing what is proper, and with a cushion, sling, and a couple of rollers, they will supply means to the proper position. A simple and appropriate apparatus for fractures of the clavicle, and those of the neck of the scapula, has been recently proposed by Mr. Davis. (See the *Practical Observations on Surgery*, p. 187, &c.) It is also calculated for cases of dislocated clavicle, and other injuries of the shoulder.

I cannot quit the subject without expressing my great regret to find the error of supposing the movement of a broken clavicle to be the end which is required. This is the one which is truly an *in situ* treatment, and which has often been made, by anxious persons, to promote through the misapprehension, never in instances of which have failed under my own observation.

Until within a few years, fractured clavicle was almost universally treated in this country by Desault's bandage. The objection to it has been apparent for some time. Nevertheless, when applied, it is adequate to fulfil all the indications necessary in this kind of injury, yet its complexity, its liability to be changed, and the pressure it makes upon the axilla in many patients, rendered a substitute highly necessary every desirable. Dr. Joseph H. Coak, of Baltimore, constructed an apparatus, in 1835, for this purpose, which in his hands was entirely successful in his cases of oblique fracture of the clavicle, and was highly recommended by Drs. Foster, Dozette, and Gibson, of the University of Maryland. It was made of leather straps and buttons, performing the triple purpose for which Desault's bandage was adapted, and its simplicity as well as its portability, together with its superiority to former patients, has brought it into general favour in the south. Dr. Northing, of New-York, has introduced to the profession an improvement or modification of Desault's bandage, which is now in general use in many parts of the United States. It consists of a white flannel roller, seven yards long, and three and a half inches wide, the circumference of which end so perfectly simple, that a description of the method will be superfluous to enable any practitioner to apply it with readiness and facility.

A full description of this apparatus may be found in the 4th vol. of the *Am. Med. Recorder*. And as it fulfils every necessary indication, without being liable to the objections which are known to exist against that of Desault, it is well worthy of the confidence of surgeons generally; and, indeed, it possesses in this country altogether to supersede it.—*Edin.*

FRACTURE OF THE CLAVICLE IN INFANTS.

The bone may be fractured in any point of its length; across the middle, either at the extremities, or above the insertion of the posterior muscle, between the scapula and the sternum. The last case is termed fracture of the neck of the humerus; but that denomination has the merit of being strictly anatomical. It is possible, however, the bone may be strictly called the neck of the humerus, may be fractured perfectly by a gun-shot wound. In such of the humerus, we understand that circular sawing which separates the tuberosity from the head.

The fracture of this bone may be transverse or oblique, simple or compound. Transverse fractures, in the middle part, below the insertion of the deltoid muscle, are attended with but little displacement, for the deltoid muscle and the biceps, being attached posteriorly and anteriorly to both fragments, contract one another, and allow only a slight angular displacement. When the fracture takes place above the insertion of the deltoid muscle, the inferior portion is first drawn outwards and then upwards on the external side of the superior. Fractures of the humerus, near its lower end, such particularly as are oblique, are not subject to much displacement; a transverse one is attributed to the breadth of the deltoid muscle; in their being covered posteriorly by the triceps muscle, and anteriorly by the brachialis muscle, which allows only a slight angular displacement, by the inferior portion being drawn a little forwards.

Oblique fractures are always attended with displacement, whatever be the part of the bone broken. The superior portion being drawn upwards by the action of the deltoid muscle, comes out to the side, and the inferior portion of the humerus, which rests on the superior, and passes above or lower externally. Finally, fractures of the neck of the humerus are always attended with displacement, produced by the action of the posterior muscle, between the scapula and the sternum, which, being attached in the lower portion near its insertion, draws it first upwards and then forwards, in which last direction it is powerfully urged by the biceps, coracobrachialis, and long portion of the triceps. In this case, the superior portion itself is directed a little upwards by the action of the infra-scapular, supraspinatus and other muscles, which raise the head of the humerus from a rotatory position in the glenoid cavity.

The succeeding swelling in the direction of the limb, the swelling, which may be very distinctly perceived by passing the broken pieces in opposite directions, the pain, and impossibility of moving the arm, &c., joined to the history of the case, render the diagnosis sufficiently plain.

Fractures of the neck of the humerus, however, are not so easily ascertained, and, though want of attention, have been frequently misdiagnosed with lesions of the bone. Yet the diagnostic symptoms of these two affections are very different.

When the neck of the humerus is fractured, a depression is observed at the upper part and external side of the arm, very different from what accompanies the fracture of the bone downwards and upwards. In the latter case, a deep depression is found, just below the insertion of the acromion, in the natural situation of the head of the humerus; whereas, in fracture of the neck of that bone, the shoulder remains in its natural position, the acromion does not project, and the depression is found below the point of the shoulder. Besides, on raising the arm, instead of finding there a rotatory motion, played by the head of the humerus, the fractured end, though sufficiently of that bone will be easily distinguished. The motion of the broken portion, and the crepitation thus produced, serve still further to establish the diagnosis.—*Edin.*

In a simple fracture of the body of the humerus, the prognosis is generally favourable; but fractures near the elbow are liable to be followed by some loss of stiffness of the joint, often very difficult to correct.

In ordinary fractures of the os humeri, it is usual to apply two pieces of soap-plaster, which together surround the limb, at the situation where the accident has happened. Extension, if necessary, being now made by an assistant, who at once draws the lower portion of the bone downwards and bends the elbow, the extension is to apply a roller round the limb. The external object is to extend from the insertion to the outer condyle, and being fixed with a soft pad, the wool cannot hurt the limb by pressure. The internal object is to reach from the margin of the axilla to a little below the outer condyle, and as is to be well guarded with a pad, filled with wool, or any other soft material.

Some surgeons are content with the application of two splints; but though the two above described are those which we are to place the greatest reliance, yet as the cylindrical form of the arm so conveniently allows us completely to surround this part of the limb in splints, I consider the employment of four better: one on the outside, one on the inside, one on the front, and another on the back of the arm. These are to be carefully fixed in their respective situations by means of tape.

Throughout the treatment, the elbow and wrist of the forearm are to be quietly and effectually supported in a sling.

FRACTURE OF THE SHAFT OF THE OS HUMERI.

Oblique fractures here differs from that adopted by Desault, and, under the name of fracture of the neck of the humerus, is not meant that of the casting, nearly perpendicular depression, which separates the head from the tuberosity of the bone. In this expression, surgeons imply the fracture of that contracted part of the humerus, which is located above by three oblique lines; which below is continuous with the body of the bone, which has the tendons of the posterior triceps, brachialis, and coracobrachialis inserted below it; and

which entry practitioners would attribute to the situation of the external angle.

Informative facts, however, prove the possibility of the anatomical neck of the bone being fractured, and it is well known that the humerus of a young man, aged 17, the head of which bone was severely crushed from its body, by a fracture which had passed obliquely through the upper part of the tuberosity. Another example, proved by dissection, has been very lately recorded by Hilcock. (Chirurgie Clinique.) An instance of this kind, I think, was pointed out to me in the spring of 1831, in St. Bartholomew's Hospital. The patient was a boy, whose elbow had been strongly kept up, on the supposition that the case was a fracture of the neck of the humerus, and, consequently, the irregular end of the humerus formed a considerable projection in front of the scapula, yet capable of being pushed back, where, however, it would not remain. When the accident is produced by a direct blow or fall on the fleshy part of the shoulder, the dislocation is sometimes contained and affected with erysipelas. Even blood may be effused from some of the ruptured arterial vessels of the artery, and form a collection which demands recumbency to be speedily opened, though the reason of such practice, as a general thing, must be questionable, because large extravasations of blood about the shoulder are usually very soon absorbed.

Mr. Astley Cooper has mentioned several both in old and in young persons; but according to his observation, it rarely occurs in middle age. In the young, he says, it happens at the junction of the epiphysis where the cartilage is situated; and in the old it arises from the greater softness of this part of the bone. (On Dislocations, &c. p. 450.)

An simple joint is experienced at the moment of the fall; sometimes the issue of something breaking is heard. There is always a sudden inability to move the limb, which, left to itself, remains motionless. But, on external force being applied, it readily yields, and admits of being moved with the greatest ease in every direction. Much tension is attended with severe pain, and, if carried too far, may cause its relaxation; as has been observed in palsy in which the fracture has been mistaken for dislocation.

Below the scapula a depression is remarkable, always situated lower down than that which attends a dislocation. If we place our hand on the head, while the lower part of the bone is moved in various directions with the other hand; or if, while extension is made, an assistant commences to move the lower a rotatory motion, the following circumstances are perceived. 1. The head of the humerus remains motionless. 2. A more or less distinct crepitus is felt, arising from the two ends of the fracture rubbing against each other. These two symptoms are characteristic of the accident; but the swelling of the joint may prevent us from detecting them.

Sometimes there is no displacement of the ends of the fracture, and then, as most of the symptoms are absent, the diagnosis is still more difficult. In general, however, the ends of the fracture are displaced, and in this circumstance it is the lower one which is out of its proper position, and not the upper one, which is held up, as is the case upon many accidents.

The displacement is generally not very perceptible in regard to length, unless the fracture be very oblique, and the pointed epiphysis retains the position, and make them contract with increased power; or when the blow, which was very violent, continued to operate after the bone had been broken, and forced the ends of the fracture from their state of apposition. In this way the body of the humerus has been driven or driven downwards, so as to protrude through the deltoid muscle and pinnascent for above the height of the head of the bone.

But commonly, as Pott observes, the weight of the two powerfully tends the union of the scapula, and the displacement of the fracture is more likely to be transverse. In that circumstance the lower end of the fracture is displaced upwards or forwards, and rarely in any other direction. In the most frequent case, the elbow is separated from the trunk, and cannot be brought near it without pain; and in the extreme of the bone being displaced upwards the limb has a tendency to the opposite direction. According to Mr. Astley Cooper, the upper end of the main portion of the humerus sticks into the scapula, where it can be felt, and the

distal is drawn down by it, so that the two ends of the shoulder is diminished. (On Dislocations, &c. p. 451.)

The reduction takes place of itself on employing a very little force methodically directed, according to the fracture is displaced upwards or forwards. If the surgeon put his hands on the situation of the fracture, it is easier to estimate the state of the ends of the bone, than it is to accomplish a thing without touch, namely, what is inspired by the bone contacted.

Every apparatus for the cure of fractures being only recommended by art in the patients causing the displacement of the broken part, it follows that the whole should not be in an inverse ratio to each power. These cannot, 1. Of the action of external bodies, formed by the extreme mobility of the arm and shoulder; 2. Of the action of the latissimus dorsi, pectoralis major, and other muscles, which draw towards the lower end of the humerus, or of the deltoid, which pulls upwards; 3. Of the continuities of the reaction of the arm, which tend to contract the end of the fracture in a little space.

Before, in the treatment, the three indications are, 1. To render the arm and shoulder immovable. 2. To bring either upwards or upwards the lower end of the fracture. 3. To draw downwards the same. The last object requires less attention than the two others, because the weight of the arm is alone almost sufficient for the purpose. Determined to employ the following apparatus.

1. Two long rollers. 2. Three strong splints of different lengths, and between two and three inches wide. 3. A cushion or pillow, three or four inches thick, as one of its ends, terminating at the other a corner point, and long enough to reach from the axilla to the elbow. 4. A sling to support the forearm. 5. A band to cover the whole of the apparatus.

The patient having been elevated, the apparatus are to be confined the extremities. Then the splints are to take the first roller, which is to be put over the epiphysis, wrist, and elbow, and be so to the one of its limbs or applying two splints, three in the upper part of the forearm. The shoulder is next to be held immovable, tight round the arm upwards, making such an oval as will enclose the arm which is immovable below it. When the roller has reached the upper part of the arm, it must be doubled back a few times to prevent the folds which the irregularity of the part would cause. The bandage is afterwards to be passed first under the opposite axilla, and the rest of it, rolled up, is to be brought up to the top of the shoulder, and continued to the arm of an assistant.

The first splint is to be placed in front, reaching from the bend of the arm as high as the scapula. The second, as the outside, from the axillary angle to the same height. The third, behind, from the extremity to the middle of the scapula. The pillow, inserted between the arm and thorax, serves as a firm point, which becomes motionless. An assistant upon these parts of the apparatus, and holds them in by applying his hands under the bend of the arm, in which is constructed the application of the remainder of the bandage.

The surgeon takes hold of the bandage again, and applies it over the splints with moderate tension, and the bandage ends at the upper part of the arm where it began.

While the assistants still keep up the extension, the surgeon is to place the pillow between the arm and thorax making care to put the thick end upwards, if the fracture be displaced upwards, and downwards if it should be displaced downwards, which I should most earnestly. Then the pillow is to be fastened with two pins to the upper part of the roller.

The arm is to be brought near the trunk, and held upon the pillow by means of the second roller applied round the arm and thorax. The turn of this bandage should be pulled tight below and above, when, if the fracture be displaced upwards; but if upwards, it should be drawn below and tight above.

The forearm is to be supported in a sling, and the whole of the apparatus is to be covered in a cloth, which will prevent the bandages from being pulled out of their places.

If the effect of the above apparatus is following the indications above specified is considered, we shall find that they are very well accomplished. The two splints fixed against the trunk, can only move upwards, and then nothing displaces the lower end of the fracture, which is equally motionless. The shoulder can

not contraindicated any motion to the upper end of the fracture. The pillow, differently disposed, however, in the direction in which the lower extremity of the fracture is displaced, serves to keep this part in the opposite position.

Should this part of the bone grow upwards, the thick end of the pillow will remove it farther from the chest. The bone will be kept in this direction from the side by the action of the humerus, which, being very tight downwards, will act upon the trunk as a lever, the fulcrum for which will be the pillow, and the resistance the action of the pectoralis major, latissimus dorsi, and triceps major. Thus the humerus will have the effect of bringing the elbow nearer the trunk, and move the lower end of the fracture in the opposite direction, so that it may here be considered as an artificial muscle directly opposing the natural ones.

When the lower end of the fracture is drawn downwards, the contrary effect will be produced, both from the pressure exercised by the humerus on the upper end of the displaced portion of the bone, and from the situation of the elbow; which is kept up by the thick part of the pillow. The outer angle will also prevent the lower end of the fracture from being displaced outwards, both by its mechanical resistance to the lever, and by compressing the internal muscles, which is the chief cause of such displacement. All displacement of the lower end of the fracture forwards or backwards is prevented by the thick pillow; and as for the longitudinal displacement, which is already prevented by the weight of the arm, it is still more effectually hindered by the compression of the muscles of the arm both by the upper and outer angles—see *Illustrations*, &c. p. 303, fig. 13.

Dr. Aitken, Cooper recommends a roller to be applied from the elbow to the shoulder, and, two splints to be bound on the inner and outer sides of the arm with a roller; a cushion is placed in the axilla in order to throw out the head of the bone; and gentle supporting the arm in a sling. Should the elbow be much raised, he says, the bones will overlap, and the splint be attached with difficulty.—(*On Dislocations*, &c. p. 303.)

FRACTURE OF THE LOWER END OF THE CLAVICLE, WITH SEPARATION OF THE COSSIDES.

Fractures of the os humeri, with detachment of its condyles, seem to have engaged the notice of most authors who have written on the diseases of the bones. The ancient, however, in this circumstance, and Denham in particular has frequent occasion to meet with it.

Whatever its causes may be, the two condyles are usually separated from each other by a longitudinal division, which extending more or less upwards, is bounded by another transverse or oblique division, which occupies the whole thickness of the bone. Hence, there are three different pieces of bone and two fractures.

Sometimes, the division is more simple; as when, taking a direction upwards or forwards, it crosses obliquely down the lower end of the os brachii, separates in the joint, and only fractures one of the condyles from the body of the bone.

In the first case the recovery is sooner, and the fractured part is more movable. When pressure is made either before or behind, on the thick of the longitudinal fracture, the two condyles, becoming farther separated from each other, leave a space between them, and the fractured part is relaxed. The humerus is almost always in a state of ossification. On taking hold of the condyles and moving them in different directions, a distinct crepitation is perceived.

In the second case, the separation of the condyles from each other is not so easy; but a crepitation can always be distinguished on moving the detached condyles. As, however, in which only the external condyle was broken, Denham found the arm always rigid; a point on which the exercise consisted in that part were, doubtless, concerned in producing.

In both cases, as we have seen, the almost inevitable effect of bending or extending the humerus; an habitual habit most state of this part of the limb, and sometimes a subsequent swelling of it, together with more or less inflammation round the joint, are observable. When the elbow has been very violent, or a pointed piece of the bone protrudes through the skin, the accident may be complicated with a wound, or even of bone, &c.

When the condyles of the humerus are obliquely

broken off just above the joint, the appearance, as described by Sir Astley Cooper, are those of a dislocation of the humerus and ulna backwards; but the nature of the case is evinced by the immobility of the distal-terminus rotating as soon as the extremity is moved, and also by the crepitation, generally perceived when the humerus is relaxed upon the thorax.—(*On Dislocations*, &c. p. 421.)

The old writers consider the communication of a fracture with a joint a fatal kind of complication. Swelling and inflammation of the adjacent parts; ossification of joint after the reduction; large abscesses, even mortification of the soft parts, and various of the bones, are, according to such authors, the almost inevitable consequences of these fractures, and undoubtedly the most formidable termination. Paré, Feut, Heister, Diemerbroeck, all give this exaggerated opinion. However, analogous illustrations of the contrary and positive prove that this representation is misplaced beyond truth. Modern observation has depicted the various degrees of the extension of effusion into the joint, and with a view of the principal causes assigned by authors for the symptoms so much dreaded.

The detached condyles being drawn in opposite directions by the muscles of the arm and thorax, necessarily again removed between their two points, and are but little displaced. Natural force may, however, put them out of their proper situation, and they may then be displaced forwards or backwards, or they may separate from each other entirely, leaving an interspace between them. Hence, the separation should occur there in these four directions, and this object is easily accomplished by means of four splints kept on with a roller. The two lateral splints are particularly necessary when the condyles are separated from the body of the bone with an interspace between them. If one of them be still continued both the humerus, as well as this side will be positive.

The apparatus used, and extend as high as when the arm is fractured higher up; but the roller should be continued over the thorax, in order that the joint may correspond to the middle of the humerus, which should here be firmer than any where else. This method is also of use in producing a gentle compression of the muscles applied into the condyles. Denham recommends the front and back splints to be flexible at their middle part, which should be applied to the head of the arm and elbow.—(*Illustrations*, &c. p. 303, fig. 13.)

The treatment advised by Sir Astley Cooper consists in bending the arm, drawing it forwards as far as to reduce the parts, and then applying a roller. The two splints for this case, he says, is one, bound at right angles, the upper portion of it being placed behind the upper arm, and the lower under the forearm. He also directs the application of a splint to the fore part of the upper arm. The splints are to be fixed with waxes; evaporating lotions used; and the arm kept in a bent position in a sling. In a fortnight, if the patient be young, and in three weeks if he be an adult, passive motion may be gently employed for the purpose of hindering an anchylosis.—(*On Dislocations*, &c. p. 422.) According to the same author, when the internal condyle is broken off obliquely, the arm bears its natural support and projects backwards.

FRACTURE OF THE FOREARM.

The forearm is more frequently broken than the arm, because external force operates more directly upon it than the latter part, especially in falls on the hands, which are frequent accidents. Hence in the account of Denham's practice, we find that fractures of the forearm often hold the first place in the comparatively of such cases kept at the elbow-joint.

We know that the forearm is composed of two bones, the ulna and radius. The last of which more liable to fractures than the first, because it is much harder with the hand by a large surface, and all the muscles received by the latter part are concentrated to it. The situation of it also more immediately exposed to such causes as may break it. However, both the bones are frequently broken together.

FRACTURES OF BOTH BONES.

May occur in the extremities or middle of the fore arm. They are frequent at the middle, very common below, but seldom happens at the upper part of the

firmness, where the laminae meet, and the considerable thickness of the alvea, must causes which would either give rise to the accident. The bones are usually broken in the same line, but sometimes in two distinct directions. The fracture is almost always single, but in a few instances it is double; and the wrist, or generally, was one day visited by a patient, that while through the whole of a cart had passed, so as to break fractures at their middle and lower part, into six distinct portions. The middle one, notwithstanding they were quite detached, united very well with hardly any difficulty.

These accidents are most commonly occasioned by direct external violence; but sometimes they are produced by a contusion, which is generally the case when the patient falls on his head. But in this instance, as the hand is principally concerned with the lower bone anterior surface of the radius, this bone seems less to sustain almost the whole shock of the blow, and hence is usually the only one broken.

The symptoms indicating fractures of the forearm are not likely to lead the surgeon into any mistake; motion at a part of the limb where it was previously inflexible; a crepitus, almost always easily felt, when there is distinct depression in the situation of the fracture; occasionally a projection of the ends of the fracture beneath the skin; pain on moving the part; a small swelling attended to the patient at the moment of the accident; an inability to perform the motion of pronation and supination; and an almost constant half-bent state of the forearm.

There is one case, however, in which the fracture being very near the wrist-joint, similar appearances to those of a dislocation of this joint may arise. But attention to whether the stated symptoms are shown or below the elbow will discover whether the case be a fracture or dislocation. In a fracture, the part is more or less movable, and there is crepitus—(compare *Chr. & Deane's*, pp. 104, 113.) According to Boyer, the two cases may be distinguished by merely moving the hand; by which motion, if there be a fracture without fracture, the typical prominence of the radius and ulna will not change their situation; but if a fracture exist, they will follow the motion of the hand.

The continuity of the two bones at the forearm by the interosseous ligament, which occupies the interspace by which they are separated, and the vessels in which the vessels situated in both are inserted into them, render any displacement of the broken pieces into the Medullary direction very difficult, and in reality, such displacement is seldom observed, and never in any considerable degree. When it does take place, it is to be ascribed to the cause of the fracture, rather than to vascular contraction. The mobility, with interosseous displacement, the first piece represents the middle, and the interosseous space is dislocated or entirely obliterated near the distal end of the radius, attended with great laceration of the part. There is an angular displacement which the fragment causes always produced, either forwards or backwards, according to its direction.

Boyer gives the following account of the treatment of the fracture of both bones of the forearm.

The forearm is to be bent to a right angle with the arm, and the last is placed in a position between the pronator and supinator. The forearm and hand being thus placed, an assistant takes hold of the first finger of the patient, and extends the fractured parts, while another assistant makes counter-extension by fixing the forearm with both his hands. By these means the operator is enabled to reduce the bones to their natural situation, and so push the soft parts into the interosseous space; by a gentle and gradual pressure on the anterior and posterior sides of the arm.

The bones are kept in their place by applying first on the anterior and posterior sides of the forearm two longitudinal and graduated compresses, the ends of which is to be in contact with the skin. The depth of these compresses should be proportioned to the thickness of the arm, corresponding to the diameter of the arm diameter. By the next piece, the surgeon takes a single-headed roller, about six yards long, and makes three turns of it on the fractured part; he then descends to the hand by circles partially placed over one another, and envelopes the hand by passing the bandage between the thumb and index finger. The bandage is now carried upwards to the wrist, and then, and re-

turned wherever the frequency of the stroke may make it necessary. The compresses and bandage being thus far applied, the surgeon lays on two splints, one anteriorly, the other posteriorly, and applies the remains of the bandage over them. The compresses and remains should be in the same length as the forearm. It must be taken to employ lateral splints in this case, being what is commonly used to be reported by most books; a displacement should have taken place in that degree. Lateral splints would counteract the compression by two other splints, by lowering the transverse diameter of the arm, and with the action of the fingers, tend to push the ends of the fracture into the interosseous space. The surgeon's attention should be particularly directed to preserve the interosseous space; for, if this be obliterated, the radius cannot return to its place, nor the motion of pronation or supination is restored; and this defect may be obtained with facility by applying the compresses and splints in their position, that the fleshy parts may be drawn out and confined in the interosseous space, and by drawing the bandage every seven or eight days.

If the fracture be simple, and the exposure moderate, the patient need not be confined to bed, but may walk about with the arm in a sling.

SWELLINGS OF THE RADII

Are the most frequent of those of the radius. The radius being almost the sole support of the hand and guided to the same line with the ulna, it is more than three times more exposed to fractures than the ulna.

Fractures of the radius, whether transverse or oblique, near the middle part or extremity, may be caused by a fall or blow on the osseous, or it happens in most cases, by a fall on the point of the hand. When likely to fall we extend our arm, and in the hand, the first is the point, in which case, the radius is pressed between the hand and the ground, and the forearm, from which it receives the whole momentum of the body, is bent, and if the fall be sufficiently violent, breaks near the lower end of the middle part. When after an accident of this kind, pain and difficulty of performing the motions of pronation and supination is perceived, the probability of a fracture of the radius is very strong. The radius is fully examined by passing with the fingers along the external side of the bone. Also, in endeavouring to perform supination or pronation of the hand, a crepitus and a motion of the broken portions will be perceived. When the fracture gives place near the head of the radius, the diagnosis is more difficult, on account of the depth of soft parts over the part of the bone. In this case, the thumb is to be placed under the external condyle of the ulna, and on the superior convexity of the radius, and as the space into the hand is to be brought into the pronator and supinator positions. If in these trials, which are always painful, the head of the radius rests immovably, there can be no doubt of two bones being fractured. Here the cause of displacement was force as in fractures of the forearm; it can never take place except in the direction of the diameter of the bone, and is opposed externally by the action of the pronator supinator. The same weakness appears in fractures of the radius; and the radius is usually fractured in the middle, and is another throughout its whole length.

In general, when only the radius is fractured, the treatment is requisite. During the treatment, the hand is to be bent, and the hand put in the supinator position, and supported; that is to say, the palm of the hand is to be the patient's breast. Having reduced the ends of the fracture when they appear to be displaced, the wrap plaster is to be applied, and over this a thick roller. This bandage is, indeed, of no utility; but it makes the limb seem, in the supporting bystanders, more comfortable than if it were motionless. However, no one can doubt, that tight bandage may not very pertinaciously, by pressing the parts and often together, causing them to grow in such a way, as at all events, making the fracture case in no good way. Only two ligaments are necessary; one to be placed along the inside, the other along the outside of the forearm. Such pads must always be placed between the skin and the splints, in order to avoid the pressure of the hard materials of splints, and to prevent sores. The inner space should extend to about the last joint of the fingers, but not completely to the last

as caused by the *fungus*. We learn from Hirsch, that more than one-third of the patients on whom he had operated for supposed carcinoma of the eye were really victims of fungus. Twenty out of twenty-five cases of fungus in the cornea of the eye, with which Mr. Wainwright has been acquainted, happened to children under twenty years of age. Now, as fungus is rather a disease of aged than young persons, and we find from Mr. Wainwright that fungus in the cornea of the eye mostly affects persons under twenty years of age, it is infinitely certain that most of the cases of fungus reported to be caused by the eye, were in fact the equally terrible disease now passing under consideration. According to Mr. Thwaites, the only source of the external or appendageous fungus to be primarily attacked by carcinoma is the sclerotic gland, conjunctiva, and eyelids; while the evidence of many cases has assured him, that fungus hematodes may originate in any portion of the eye, with the exception of the iris and ciliary bodies of the interior of the eye, p. 295 (not and 421). This account, however, differs from that advanced by Mr. Wainwright and Professor Scarpa, who describe the disease as first commencing in the iris, and particularly at the point where the aqueous humor enters the eye. "For (says the latter author, in the first appearance of the infection) a greenish spot, the centre, on examination, is found to be purplish red, and, in other words, to have degenerated into the so-called fungus. It is also found, that this disease spreads, while the fungus hematodes is in its incipient state, does not appear to have suffered any remarkable alteration in its nature, and that it is only at a more advanced period of the disease that this membrane becomes thickened and organized with its connection with the sclerotic." The disease continues, even in the most advanced stage of the disease, preserves, more than all others, its natural form. (On the Principal Diseases of the Eye, p. 307, ed. 2.) In cases of fungus hematodes, the sight of seeing objects is generally destroyed before the direction of pupils is turned to the outward. Frequently, however, a slow, dimmed, or aphakic, precedes the growth of the disease. When no external evidence has occurred, the first symptom is a trivial itching at the vertex of the cornea, the iris becoming, at the same time, extremely vascular, and altered in colour, and the pupil dilated and irritable. There is seldom much vascular matter in the eye; but the iris is sometimes observed to be enlarged and to extend. In adults, fungus hematodes of the eye occasionally commences without any apparent cause, though sometimes it is consequent on a blow. At first, the iris cornea is slightly reddened, and vision imperfect. The iris and cornea, or slight increase of vision, and an opening of the pupil is experienced; the eye itches, and the iris is changed.

With regard to the state of the fungus hematodes of the eye, the only chance of effective treatment depends upon the early recognition of the disease. It is not to be acknowledged, however, that most of the operations, in which the diseased eye has been removed, have been proved unsuccessful, owing to a recurrence of the disease. The removal of such a success may be expected to the optic nerve and other parts being almost always in a morbid state, before all attempts to retain the eye. One case, however, detailed by Mr. Thompson (who has sent in the following letter concerning the operation for the disease, was operated upon, and as a consequence of the disease had occurred a remarkable improvement. No other instance was alluded to more than the congenital and extent of the disease reported.—On the Principal Diseases of the Eye, p. 412.) The most successful extirpation of an eye in its advanced stage of this disease, and, perhaps, the only satisfactory one at present on record, is that which was performed by Mr. Wainwright, the case containing complete details of the operation.—*Opus Oculi*, Mr. Wainwright, vol. II, p. 411. The operation was nearly always found to be successful, when the disease was advanced so far that the posterior chamber is filled by the fungus mass. With the very few exceptions, which there are to this statement, it may be correctly said, that, as no internal preparation was attempted, certainly affected the heart, hope of curing any case of the fungus hematodes, it is manifest, that when the disease of the eye extends beyond the limits of any internal

aid from surgery. In a case which I saw in April, 1821, in the London Eye Infirmary, the disease formed a fungus mass as large as an orange, accompanied with enlarged lymphatic glands over the tumor. The patient was an infant. In this instance, Mr. Lawrence used, as a local application, the liquor oculi sedentaria, prepared by Mr. Bailey, which was found to lessen considerably the child's suffering.—(See particularly Wainwright's *On the Principal Diseases of the Eye*, vol. II, p. 412, and in *Wainwright's Treatise on Diseases of the Eye*, and Dr. Treves's *Synopsis of the Diseases of the Eye*, 8vo. Lond. 1823.)

STAGES OF THE DISEASE OF THE EYE

1. In the extension, the disease begins with a small cauliflower growth, which, moist and elastic, it flows to the touch, relieving even, such as a tumor; but otherwise it is firm. At first, it arises from the cornea, but by degrees a second tumor grows successively through it more and more frequently, and at length becomes incessant. For a considerable time the tumor is smooth and even; but afterwards it projects irregularly at one or more points, and the skin at these places becomes of a whitish color, and feels thicker. At this situation, it easily yields to pressure, but instantly rises up again. Small openings now form in these projections, through which is discharged a thin bloody matter. Almost immediately after these fissures burst, a small fungus protrudes from the pupil, and then rapidly increases, both in breadth and height, and has exactly the appearance of a cauliflower fungus, and frequently bleeds profusely. The matter is thin, and exceedingly soft, and the pain becomes of the stinging kind. The instruments, by a little way round these tumors, are not to be used. After treatment takes place, the neighbouring glands swell, and assume exactly the same condition as the primary tumor. If the patient will submit the disease to its present advanced progress, similar tumors form in other parts of the body, and the patient dies soon.

After death or preparation the tumor is found to consist of a soft substance, sometimes like the basis of a greyish tumor, and greatly appearance, with this membranous structure, extending through it, and ends, or absorption in different places, occupying a thin fleshy matter, occasionally in very considerable quantity. There does not seem to be any entire rest, extending the tumor. It is very frequently seen to grow between the eyelids, or even to the lower, to which it often appears to adhere. The neighbouring structures are of a yellow color, and lose their former appearance, becoming more like liver than vessels. The tumor is always cancerous in the vicinity of the disease.

The disease is sometimes caused by external violence, though it is general there is no evident cause whatever.—(Observations on Inflammation, by J. Hunter, vol. 2.)

Mr. Hay has given several cases of the fungus hematodes. If I have the most particular circumstances relative to one of them, it will suffice to inform the reader of the facts in which this terrible affection has presented itself in this gentleman's practice.

A young man, David Macgregor, two years before applying to Mr. Hay, perceived a small swelling on the inner of his right eye, but far from the pupil. This tumor was movable, and did not impede the motion of the eye; it was not discoloured, but was painful when moved or pressed upon. It continued in this state half a year, and then the man having been his knee against a stone it gradually increased in bulk, but did not exceed the size of an egg. The skin was now discoloured with blue spots, which were taken to be veins. He could still walk with ease, and follow his business.

Two months before his admission into the London Infirmary he was with a fall, and violently beat his knee, but did not strike it against any thing. The tumor began immediately to enlarge; and, within a few days, it reached half way up the inside of the thigh. About a fortnight after this accident the skin burst at the lowest part of the tumor, and discharged some blood. A dark-colored fungus, about the size of a pigeon's egg, here made its appearance, and a few weeks afterwards the skin burst at another part of the large tumor, and some blood was again discharged. From the latter arose another fungus, which had increased in the

In short, the only chance of cure consists in destroying the whole of the diseased parts, restoring not only the wall, but the fungus membrane, but every part of the cyst, more or less, in which it may be contained. An incision of this kind, however, is only advisable in the early stages, while the disease is entirely local, if a severe case, a considerable part to be destroyed; for, after the neighbouring glands have become affected, the chance of recovery is almost destroyed. It is sometimes difficult, however, to perform patients at an early period in relation to prognosis or prognosis, because the pain and inflammation are considerable; and the operation should be timed with all the views which a restoration of its absolute necessity and the fatal point of duty ought to bear.

The attempts to cure the disease by setting it away, have been attended with such ill success that some surgeons deem it advisable not to follow this method, but to destroy the bulk of the cyst. The principal views of the disease appear to me to be most judicious and rational. First, that if an incision be made to cut every the cyst, and save the wall, the surgeon must be careful to remove at the same time a considerable quantity of the soft parts in the neighbourhood of the swelling, so that the matter that is about the cyst is likely to be removed. Thirdly, that after the incision is made, an absolute examination of the surface of the wound should be made, and every dangerous part should be cut away. Fourthly, that should the disease still remain, the operation ought to be judiciously performed. Fifthly, that should the disease never be applied to this disease. Finally, that even when one of these operations effectively removes the disease of the wall, the patient's entire recovery is always benefited accordingly to the views of the disease, and other possible parts being properly affected, at the time of the operation, with the whole set of disease.

SYMPTOMS OF THE DISEASE.

1. Fungus humoralis of the testis sometimes begins in its glandular part, sometimes in the epididymis. Its progress is slow, and the pain generally not severe. But as soon as there is any complaint of hardness of the diseased part, or change in the colour. When the testis has become considerably large, it feels remarkably soft and elastic, as if it contained a fluid. Hence, the case has often been mistaken for a hydrocele, and sometimes with a success. (Wadding, *Edin. Med. Chir. Trans.* vol. 2, p. 38.) Occasionally, when the tumour is large, it is in some places hard, in others soft. The hardness may be known by the nature beginning to collect at the bottom of the scrotum, and then ascending towards the spermatic cord, and by the swelling being diminished towards the tubercle. When the fungus humoralis begins with a general enlargement of the entire testis, followed by a hollow, which extends to the epididymis. It is not in the distended disease of the testis, and is much harder than a simple bulk of water. (Roth, *ibid.*) As the disease advances, the testis becomes more and more enlarged, but not so much as the epididymis. When the ligament glandularis becomes enlarged, they often become of enormous size; and as soon as the epididymis then follows, large portions of them slowly away. Fungus humoralis of the testis is seldom attended with more distress than old age. The disease, the exhibition of the diseased testis is found to present a nodular or pimple appearance, generally of a pale brownish colour, though sometimes red. It is joined near the tunica vaginalis and tunica albuginea are adherent together occasionally, in fact between them.

In an example described by Mr. Lawrence, the swelling of the testis consisted of cellular matter filled with pimple matter. Numerous tubercles of the disease were found in the scrotum, and along the penis, intermingled with cellular matter. A mass of soft matter, which it was a man's kindness to the spine behind the scrotum and penis, which felt very hard and elastic for some time. The spermatic vessels could not be found. (See *Med. Chir. Trans.* vol. 4, p. 11.)

The only chance of a cure must be formed from a very early performance of castration, before the disease is extended to the inguinal glands, or up to the spermatic cord. Indeed, very little hope should be

placed in the removal of the tumour; the fungus humoralis appears to be rather a constitutional than a local disease. Nearly every case on record has terminated fatally, and upon dissection shows the liver, the lungs, the brain, the mesenteric glands, or other internal parts, have been found affected with the same disease. In one case described by Mr. Lawrence, tubercles of a cellular structure to the disease in the testis were found in the lungs, liver, and, in short, in nearly all the thoracic and abdominal viscera, though the contents of the skull were free from disease. (See *Chir. Trans.* vol. 4, p. 11.)

Who shall give this subject with strong words of the principal differences between two diseases which have been commonly mistaken. A scirrhus testis is, from the commonest, hard, firm, and homogeneous, and is composed of two substances, one hardened and fibrous, the other soft and mucous. The fibrous matter is the most abundant, consisting of cells, which are fewer than the soft substance between them. A scirrhus testis, caused in the gland is not equalled by any separated from the latter part, so much as the two substances blended. A scirrhus is a further situation sometimes involves the surrounding cellular substance, so as to form a kind of cystic, and becomes a circumscribed tumour. When a scirrhus involves the testis, a thin scar is described, and a good deal of the hard fibrous substance is destroyed by the absorption; some parts become affected, and the patient dies from the increased pressure of the disease, and the retention of the secretion. Sometimes, though not always, after a scirrhus has developed, it ends in fungus of a very hard texture. Such excruciating, however, is not met described by the physicians. Cancerous nodes, also, frequently put on for a short time, in some cases, an appearance of fluctuation. On the other hand, the fungus humoralis, while of moderate size, is soft, elastic swelling, with an equal surface, and a decided feel of fluctuation. It is a general, upon examination, being involved within a capsule. The substance of the tumour, instead of being for the most part hard, consists of a soft, pulpy, medullary matter, which usually flows with water. When liberation occurs, the cancer is not increased by this process, which scirrhus; but a fungus is created, and the whole swelling grows with increased rapidity. Cancerous diseases are mostly met with in persons of advanced age, while fungus humoralis generally affects young subjects. (Wadding.) Many surgeons have now proved, that the substance of fungus humoralis may contain cellular matter, which is the only cellular matter.

Fungus humoralis, in its early stage, is generally attended with less pain than what is experienced in cancer of scirrhus. The former also has a less definite boundary than a scirrhus, and it is more difficult to say where the diseased structure terminates, and where the healthy commences. When the disease is in the breast, there is less tendency than in scirrhus to increase in the cellular glands, which may require some thought the disorder in the breast may have advanced to suppuration and necrosis. In the breast the disease is also much quicker in its progress than scirrhus. (See *Chir. Trans.* vol. 2, p. 38.)

In cases of external cancer, the vessels are in general affected at the same time with scirrhus disease, but the similarity of examples of fungus humoralis, this disease is found affecting in the same subject a variety of parts. In addition to the external tumour, we find swellings of a similar nature, perhaps, in the liver, the lungs, the mesenteric glands, or even in the brain. Yet Mr. Ross will have it, that cancer and fungus humoralis are the same disease; or at least that the latter is only a species of the former, and that in both cases disease proper to the testis prevails. (See *Chir. Trans.* vol. 4, p. 11.)

See *Observations on Inflammation*, by J. Brown, vol. 2. *Key's Practical Observations on Surgery*, vol. 2. *First and Second Editions*. *Observations on Fungus Humoralis*, as Soft Cancer, by James Wardrop, M.D. Edin. 1808. This last publication is highly interesting to the attention of the surgical practitioner, the disease in different organs being well described, and the characters distinctly marked from that of cancer.

A note of this disease is related to vol. 5 of the *Lancet*.

the Medical Journal. It was the consequence of an attempt to cure a gonorrhoea by means of a lotion, and it proved fatal. A case is also related by Dr. Abernethy, in *Surgical Observations*, 1804, p. 93. See also a Case of Dissected Testicle, accompanied with Abscess of the Lung and Pleura, by H. Esdaile, in *Medical-Chirurg. Trans.* vol. 2, p. 53, &c. in which not, four other cases are recorded by Dr. Latham, p. 71, et seq., and one by Dr. Longstaffe, p. 277, which last Latham is here quoted as occurring with the gonorrhoea and Dr. Latham, a short time before the patient died. See also Longstaffe's *Cases and Observations* in the 5th and 6th vols. of the same work. Former fell a Londoner in 1814; on *Parasitic &c. in the Cervix Uteri*, in *Chirurg. Transactions*, p. 211, &c. On *Foreign Matter in the Cervix Uteri* see some valuable observations in the 4th edition of *Wegscheide's Treatise on the Diseases of the Uterus*. See also *Reynolds on Diseases of the Uterus*, and *Thomson's Synopsis of Diseases of the Uterus*, 2nd. Lond. 1831. C. Fick on *Diseases of the Eye*, p. 267, ed. by Welford, 2nd. Lond. 1855.

Respecting mediastary carcinoma, which is generally considered the more efficacious as far as immatures, more further observation will be bestowed in the article Tumours.

PERUNCULUS. (From *peru*, see page.) A boil, so named from the violence of the heat and inflammation attending it.

A boil is a well-circumscribed, very protruded, hard, deep red, inflammatory swelling, which is extremely painful, and commonly terminates in a slow and protracted suppuration. The focus of the tumour is generally that of a boil, the size of which is considerably below the surface. Upon the apex elevated part of the boil there is usually a whitish or livid point, which is insignificantly scabbed, and immediately beneath this is the point of the abscess. The matter is usually more or less, is always very abundant, and never finally in firm, sanguineous, rounded, white, blood. The organ is not less attacked with fever, except when the tumour is very large, situated in a sensitive part, or when several of these swellings occur at the same time in different places. In the late circumstances they often occasion in children, and even in infants' whites, tenderness, loss of appetite, sweating &c. They rarely exceed a pigeon's egg in size, and they may originate in any part of the body.

Boils commonly arise from constitutional causes. Young persons, and especially subjects of full plethoric habit, are most subject to them. The disease is also observed to occur with most frequency in the spring. — (*Lancet*, Pathologic. Chir. t. 1, p. 163.) According to Richardson, the origin of this depends upon a disordered state of the gastric organs. — (*Neurologie Chir.* t. 1, p. 124, &c. 2.) Frequently they arise without any evident cause, and especially in healthy constitutions. At other times they follow eruptive diseases and typhus. — (*W. Gibson, Lectures, &c. of Surgery*, p. 48, vol. 1.)

The suppuration attending a boil is never perfect, and the matter which issues is not only mixed with blood, but accompanied with a bloody exudation, which issue generally is discharged before the part affected well separate kindly, and the disease end. Richer compares the stage is a kind of bag or cyst, and the whole boil is an inflamed cystic tumour.

The best plan is mostly to endeavour to make this suppurate as freely as possible by applying external caustic remedies. This seems to be the natural course of the disease in its progress to a cure, and indeed, all endeavours to disperse inflammation promote

excessively full, or succeed very imperfectly; only removing the inflammation, and leaving behind an indurated hardiness, which sometimes varies in persistence, according to its situation, every now and then returns anew, and never entirely disappears until a new suppuration has been established.

In a very few cases, perhaps, a cure is to be ascribed to various views. For this purpose, besides bleeding, gentle bruciations, and a low diet, which are requisite in this as well as other local inflammations, some prescribe an external application freely brought on, diluted with sulphuric acid, diluted, or concentrated oil.

But in the majority of instances suppuration must be prevented by the use of emollient poultices. The incision, when allowed to issue, generally does so in 10 or 12 days. However, as the suppurate is generally long in forming, and too slow to allow the sloughy exudate substance to be discharged, it is always best, as soon as matter is known to exist in the tumour, to make a free opening with a lancet, and immediately afterwards to press out as much of the matter and blood as can be gradually done. This having been accomplished, and the rest of the slough pressed out as soon as it is practicable, healthy pus will be issued, and the part will gradually subside. Until the suppurate becomes of the healthy kind, and the sloughy substance is completely discharged, an emollient dressed poultice is a good application; and when granulations have begun to fill up the cavity, pain less, and a larger poultice by its better cleansing necessary.

For the purpose of stimulating the parts, and curing it to fill up, *Paracelsus* Gilman, of Tyndall, the surgeon employed with various success in the cure of boils.

When there is reason to suppose the parts ought to be in a disordered state, an emollient is given in the early part of the treatment, and afterward repeated doses of any of the mild purgatives.

When an indurated tubercle continues after suppuration, and suppurative state of long has terminated, the part should be rubbed with compressed mercurial ointment.

Besides the above accidents, authors describe a variety of one, which is not frequently as large as a walnut, and which is diffused slowly from the surface, sometimes vesicular, sometimes, and in most instances which have been figured by the use of mercury.

The syphilitic boil is commonly pointed upon the extremities, is of the same size as the syphilitic boil, but is not attended with much pain, nor any considerable discolouration of the skin, and suppuration is not advanced, and the matter is seldom ever formed before the end of three or four weeks. Thus, like the former, sometimes appears in a considerable number at a time. The discharge is always thicker than pus, and when the boil is large, and has been long in separating, a great deal of strongly odorous matter must be got off before the cure will hold.

The principal thing requisite in the local treatment of all tubercles and tubercular tumours is to make an early free opening into them, and to pour on the matter and sloughs, employing excellent poultices, all the method parts are detached and removed, and afterward simple dressings. — (*See Principles of Surgery*, Book II, *Suppurative &c. of Wounds*, &c. *Lancet*, Pathologic. Chir. t. 1, p. 12. Richardson, *Neurologie Chir.* t. 1, p. 122, &c. V. W. Gibson's *Lectures of Surgery*, vol. 1, *Paracelsus* 1801. C. F. H. Larrey's *Recherches*, &c. t. 1, p. 257, &c. 1822. *N. J. Chalmers, Researches for Chir.* t. 1, p. 24, &c. 1823.)

G

GANGLION. (*ganglion*.) Is surgery, a tumour on a tendon or aponeurosis.

A ganglion is an outpocket, circumscribed, suppurative swelling, commonly free from pain, resting on a fibrous in the colour of the skin, and formed upon tendons in different parts of the body, but most frequently upon the back of the hand and over the wrist. A French gentleman consulted me, who had one upon the upper part of his foot, which created a great sensation of

weakness in the motion of the foot; and I have twice since that ganglion, which particularly affects the foot, how the knee-joint is to be made who are in the habit of having a great deal in order to move some. A curious example is recorded, in which a ganglion, situated exactly over the spinal column, and the spinal cord itself, was at first supposed to be an aneurysm. — (*See Folia Med. and Surg. Journ.* No. April, 1811.) These tumours, when occupied, often in passing

considerable elasticity. They often never approached by any accident; frequently, they are the consequence of bruises and violent agitations. They seldom attain a considerable size, and ordinarily are not painful, though every now and then there are instances to the contrary. When opened, they are found to be filled with a viscid, transparent fluid, resembling white of egg. If they do not disappear of themselves, or are not cured while seated by surgical means, they, in some cases, become so large that they cause great inconvenience, by obstructing the motion of the part and interfering it partly.

Dissecting applications sometimes succeed in curing ganglions, and in this country itself with the oleum serpentis is a very common method. There, when even such remedies very much benefited by this plan of treatment, but seldom cured; for no sooner has the fluid evacuated than the fluid is the cyst is general, and sometimes again.

Compressions are usually recommended than dissection. Persons with ganglions have been recommended to rub them strongly with their thumb several times a day. After they had been opened very often the tumor has sometimes disappeared. But the best method is to make constant pressure or compresses by means of a piece of sheet-lead, bound upon the part with a bandage. There is no objection, however, in taking care as before a day, in conjunction with this treatment, frictions with the oleum serpentis or diaphanized mineral oil, provided these frictions together do not seem likely to make the tumor increase, as even slight motion always so carefully avoided. Ganglions, when injured too much, have been known to become about malignant fungous diseases.

Scars have been recommended to be introduced through ganglions with a view of curing them. This method, however, is not an eligible one; for it is by its effects free from danger, as the records of surgery fully prove. Carcinomata, and even a malignant testis (Med. Journ. vol. 5), have arisen from the irritation of a wound passed through a ganglion.

Frequently, when a ganglion inflamed and abscesses, the cyst throws out a fungus which is of a very malignant nature. Hence, the practitioner should avoid making an opening into the cyst, or doing any thing which is likely to excite suppuration or inflammation of the disease. Ganglions may be cured by pressure sufficient to rupture the cyst, and some authors have recommended putting the hand affected upon a table, and then striking the ganglion several times with the fist or a mallet. The cyst of a recent ganglion may also be burst by compressing it strongly with the thumb, or with the intervention of a piece of tannin; the fluid effused into the adjacent cellular membrane, and pressure being now relaxed, the opposite side of the cavity become filled by the exuberant inflammation, and the recurrence of the disease is prevented. On this principle Mr. Acland Cooper cures the disease. (See *Encyclopædia Medico-chir.* part. 4th art. Ganglion, London, Publishers. Chir. t. 1, p. 40, 41; *Medic. Novæque Practicæ Chir.* t. 2, p. 1.)

In almost every instance, a ganglion may be cured by pressure and friction; and if not actually cured, the disease may be rendered so harmless by these means, that few patients would choose to have the tumor cut out. These frictions, the swelling becomes very much diminished, and should it enlarge again, the mode of cure is the same, and the case so little troublesome, that patients generally content themselves with occasionally wearing a piece of lead on the part.

But when ganglions resist all attempts to disperse or reduce them, when they become extremely numerous, either by obstructing the motions of the part or causing pain, they should be carefully dissected out by first making a longitudinal incision in the skin covering them, then separating the cyst opening side from the contiguous parts, and finally cutting every particle of it off the subjacent tendon or fascia. The greatest care must be taken not to injure any opening in the cyst, as to let out the contents, and make it collapse; a consequence which would render the dissection of it entirely out much more difficult.

The operation being accomplished, the skin is to be brought together with sticking plaster, and a compress placed over the situation of the tumor, with a view of healing the wound and the cavity is obliterated.

When the ganglion has burst, or is situated, it is best to remove the diseased skin together with the cyst,

and of course the incision made by oval or circular, as may seem most convenient. The grand object is, not to allow any particle of the cyst to remain behind, as it would be very likely to throw out a fungus, and produce a cure. In Warton's Cases of Surgery is an account of two considerable ganglions which this treatment, in imitation of Celsus and Ponsus Agrippa, thought it right to extirpate. These had become adherent to the fibres of the fingers. In the operation he was obliged to cut the transverse ligament of the wrist, and the patient, who before could not shut their hands, now close their fingers, perfectly regained the use of these parts. Mr. Gooch relates a case of the same kind, which had been occasioned by a violent bruise three or four years before. The tumor rubbed from the wrist to the cubit of the hand, and created a great deal of pain. Mr. Gooch separated it, and then removed the portion of the hand and fore-riding of the joint by the use of trepanning application and various phlebotomy, made with a machine constructed for the purpose. Other cases, confirming the safety of curing ganglions are recorded in the London Medical Journal for 1807, p. 121; by Ellis, in *Ann. de Med. et Chirurgie de Paris*, t. 5, page 150; Schenker, in *Chir. Hædelsburger*, t. 1, p. 232; *Journal, Lippincott*.

The ganglions which occur just before the knee I have seen cured by a little tannin applied over them, and kept open by the same means. Ganglions, indeed, have been proposed as a means of discharging other ganglions. (Lange, *Chir. Chir.* t. 2, p. 5.)

For information relative to ganglions, consult Warton's Cases in Surgery, *Classical Works of E. Gooch*, vol. 2, p. 216, *Master's Surgery*, R. Acland's Surgery, *Letter's Synopsis of Surgery*, *Encyclopædia Medico-chir.* part. 4th art. Ganglion. *Pract. Chir.* for Wundt, t. 1, p. 40, 41; *Journal Pathologie* (Chir. t. 1, p. 260). *Dict. des Sciences Méd.* t. 17, p. 211.

GANGRENE. (From *γὰρ* to feed upon.) An insupportable mortification, so named from its eating away the flesh.

Authors have generally distinguished mortification into two stages, the first, or isempic, and the second, or ischæmic, which is attended with a sudden discoloration of the part, which after being yellowish, becomes of a greenish hue, a detachment of the cuticle, under which a fetid fluid is effused; lastly, the swelling, tension, and hardness of the part, the inflammation subsides, and on separating the part a cavity is perceptible, owing to the excretion of air in the gangrenous parts.

When the part has become quite cold, black, stony, insupportable to moving, and destitute of all feeling, circulation, and life, this is the second stage of mortification, termed sphacelus. Gangrene, however, is frequently met with gradually with the word mortification. (See *Mortification*.)

GASTROICILE. (From *γαστήρ*, the stomach, and *κύλινδρος*, a ferment.) A ferment of the stomach.

GASTROGRAPHIA, or gastrography. (From *γαστήρ*, the belly, and *γράφω*, to write.) A state of the belly, and sense of its contents.

Although the term *gastrographia*, is strictness of style, signifies the sewing up of any wound of the belly, yet Mr. W. Sharp informs us that in his time the word signified, that the wound of the abdomen was completed with another of the bowels.

The moderns, I think, seem to fix the meaning of the word to the operation of sewing up a wound in the peritoneum of the abdomen.

What was formerly meant by *gastrographia* could scarcely ever be practised, because the symptoms laid down for distinguishing when an intestine is wounded do not, with any certainly determine in what particular part it is wounded; which want of information makes it, almost to open the abdomen in order to get at it. Hence the operation of stitching the bowels can only take place when they fall out of the abdomen, and when we can see where the wound is situated. And, indeed, even in these circumstances the employment of sutures is a practice the propriety of which is questionable, as will be further considered in the article *Wound*.

The circumstances making the practice of sewing up a wounded intestine proper are such, that Blandin, who was the most famous surgeon in the French army a great many years, and at a period when deaths were particularly frequent, and his country at war, declared

giving internally the extract of croak, relieved, and scap. — (*Engelhardt's Mythologie, p. 101.*) The topical use of stilly ought to be tried, but from the history of the disease, the chance of cure here, evidently be nearly hopeless. — (See also *Dr. B. Reprint de Morbis Internis, Paris, 4to, 1800.*)

GLIST. By this word is commonly understood a convulsed running or discharge, after the inflammatory symptoms it has had for some time ceased, attended with pain, sometimes making water, &c. Mr. Hunter remarks, that it differs from a gonorrhoea in being spontaneous, and in the discharge consisting of globular bodies, contained in a stony matrix instead of serum. He says, that a gleet seems to take its rise from a kind of action which the parts have contracted. The disease, however, sometimes stops of itself, even after every method has been imperfectly tried. This probably depends upon accidental changes in the constitution, and not at all upon the nature of the inflammation. Mr. Hunter had a suspicion that some gleet were connected with aphrodisia. Certain it is, the venereal cases more gleet than the common cold bath, or any other mode of bathing; and a cure was sometimes effected, although he was accompanied by an epidemic of dried sea-water.

Gleets are often attended with a venereal constitution. They also sometimes arise from other affections of the urinary, besides gonorrhoea. A cure is almost always accompanied with a gleet, and so constitutes a disease of the venereal gland.

It is remarked by Mr. Hunter, that if a gonorrhoea not arise from any venereal cause, and cannot be supposed to be a return of a former gleet, its consequence of a gonorrhoea, after a situation or disordered prostate gland is to be suspected; an inquiry should be made whether the stream of urine is meeting this condition, whether there is any difficulty in voiding it, and why; then the truth is made a little frequent. It should be by each symptom, a leucorrhoea, either under the common name, should be introduced; and if a gleet (as the English with complete ease, the French is probably in the prostate gland, which should not be mistaken. — (*See, however, Struthers's, and Whistler's Works.*)

Exhaustion, impotency, and the venereal cure, given internally, are of service. Especially in slight cases; and when they are useful they prove so almost immediately. Hence, if they had neither answered nor improved the gleet in five or six days, Mr. Hunter never employed these things. The same observation applies to leucorrhoea, as celebrated of late as a remedy for gonorrhoea and gleet, and the common dose of which is ʒi. Every case does not last these seven days. As the discharge when removed is also apt to recur, such medicine should be continued for some time after the symptoms have disappeared.

When the whole constitution is weak, the cold bath, sea-bath, bark, and steel may be given. The diet should consist of milk and stilt of steel, given as internal stimulants, have little power.

With regard to local applications, the uterine pessaries recently used are, the decoction of bark, sulphur of zinc, stann, and preparations of lead. The silver vitellina species, of the old London Dispensatory, diluted with eight times its quantity of water, makes a very good injection.

Invigorating applications consist either of injections or bougies, usually accompanied with irritating cathartics. Various remedies may be considered as having the same effect. Such applications should never be used till the other methods have been fully used and failed, unavailing. Only at first increase the discharge, and as this secret is somewhat stopped, the cure. Two grains of the oxydum of mercury, dissolved in eight ounces of distilled water, make a very good irritating injection. In venereal leucorrhoea, as applications may be given here, and therefore, if possible, the possibility of the parts to bear its employment should first be made out.

Bougies sometimes are violent, but Mr. Hunter thought, that most efficacious these injections. A bougie introduced six or seven times, and that he used a month or six weeks before the cure can be depended upon. Bougies introduced with sulphur or turpentine were formerly employed for the cure of gleet; they did not require so long a trial as venereal bougies: at present, I believe, they are not used at all by any surgeon of eminence. Venereal bougies are employed should be under the common use.

Mr. Hunter knew a gleet disappear on the smoking of one or two ounces of the opium. Gleet here also been cured by a blister, put the under side of the scrotum, and by electricity.

In every plan of treatment, rest or quietness is generally of great consequence; but, after the failure of the local means, riding on horseback will sometimes immediately effect a cure.

Regularity and moderation in diet are to be observed. Abstinence with women often causes a return or increase of gleet; and in each case, it gives symptoms of a fresh infection; but the difference between this and a gonorrhoea is, that here the return is almost immediately after the cure.

Gleets in women are cured easily in the same manner as those of men. Turpentine, however, has no specific effect on the vagina, and the strongest injections used, may also be stronger than those intended for male patients.

The history of gonorrhoea, pretty freely described, and for some time, a powerful means of restoring the tone of the genital organs, and of restoring them. The use, however, must be preceded by some time. In most instances of the system in which a gleet discharge depends upon a venereal cause in the prostate gland, Dr. Ferrius, of New-York, has given the powdered extract of gold with milk, in cases where the essential function of urine proved irritable, and seemed to require constant use. One Atomized remedy, the specific, originated in increases of the secret to be overlooked. While it is necessary, the tone of the genital organs, it is valuable in various affections of the urinary organs. — (*See, p.*

See A Treatise on the Venereal Disease, by John Hunter, M.D. Also, Nodding's Practical Therapeutics, Venereal Complications.

GLAUCOCATHESIS. (*From glaucos, the green, and cathesis, to remove.*) The green glaucocathesis was a sort of leucorrhoea, one of the kinds of which served to depress the lungs, while the other was applied under the skin.

COITUS. See *Beauchamp's*.

GYNOECOLOGIA. (*From gyna, the woman, and logos, to talk.*) Etymologically, an imaginary knowledge of the female sex; but, according to modern usage, a disordered genital infectious matter, from the first in the male, and from the vagina and uterus of the female, whence it is called, &c., in the female subject.

Dr. Stenhouse, after considering the etymological import of the word, remarks, that if a Greek word is to be translated, he would call it *leucorrhoea*, *leucorrhoea*, *leucorrhoea*, and *leucorrhoea*. However, as most of the moderns consider the discharge as just, not merely, the etymological import of *leucorrhoea* is as objectionable as that of *gonorrhoea*. Mr. Hunter has repeatedly examined the discharge with a microscope, but without perceiving any essential difference between such discharge and the pus effused from an ulcer. — (*See Complications affecting the Scrotum and Ejaculation of the Penis, p. 208.*) In English, the disease is sometimes called a *drop*, from the old French word *droppe*, which were vulgar slang, kept and imbibed by stage prostitutes, and generally confined to a particular quarter of the town, so as even now the case is as frequent as the great town in Italy. In German, the disease is called a *trapper*, from *trappen*, and in French, a *leucorrhoea*, from *leucos* and *trapping* in making water. (*See Hunter's*)

We shall first discuss the matter with regard to Mr. Hunter's opinions concerning the nature of gonorrhoea, its symptoms, and treatment; and, lastly, take notice of the observations of some other writers.

When an irritating matter of any kind is applied to a sensitive part, it increases that secretion, and changes it from its natural state to some other. In the present instance, it is changed from serum to pus.

Till about the year 1750, it was generally supposed, that the matter from the urethra in cases of gonorrhoea arose from blood in the passages; but about that time it was ascertained that pus might be secreted without a breach of continuity. It was first accidentally proved by dissection, that pus might be formed in the bag of the pleura without absorption; and Mr. Hunter afterwards examined the urethra of male patients and others, who were diseased or died while known to be affected with gonorrhoea, and demonstrated that the canal was merely free from every appearance of blood.

The time when gonorrhoea first appears after intercourse

tion, is extremely various. It generally comes on sooner than a chancre. Mr. Hunter has reason to believe that in some instances the disease begins in a few hours; while in others, six weeks previously elapsed; but he has known it begin at all the intermediate periods. However, it was his opinion, that about six, eight, ten, or twelve days after infection is the most common period.

The nature of the urethra is subject to inflammation and suppuration often varies with respect to the various parts; and sometimes discharges impudently, when the immediate cause has been removed. Such may be called early gonorrhoea, having nothing of the venereal infection in them.

Mr. Hunter knew of cases in which the urethra suppurated, with the emission of a fluid, and all the symptoms of a gonorrhoea were produced. This happened directly from the same patient. The urethra is known to be sometimes the seat of the gleet; and Mr. Hunter was acquainted with instances of its being the seat of venereal infection.

When a morbid matter has once entered the inflamed urethra, its secretions are increased and viscid almost. Also, when irritation has produced in the urethra, just as it does in the gland, a secretion of mucus takes place, the infection of which, it is said, seems to be confined to the inflamed part. But in inflammation arising from specific or venereal poisons, the infection cannot be thus got rid of; for although the first irritating matter be washed away, yet the new matter has the same quality as the original one; and therefore, upon the same principle, it would produce a perpetuation of inflammation, even if the venereal infection, like many other specific diseases, were not what it really is, kept up by the specific quality of the inflammation itself. This inflammation, however, is highly capable of cure, as I have said, the symptoms peculiar to it, consisting of suppuration, by the parts becoming less and less susceptible of irritation; and the subsequent external application has no power of removing the original irritation, for otherwise there would be no need to discharge. The time when the susceptibility of the urethra lasts varies almost upon the difference in the constitution, and not upon any difference in the poison itself.

Mr. Hunter believed that the venereal disease only caused spontaneously when it attacked a secreting surface, and produced a more secretion of pus without suppuration. Such were some of the arguments of this great man, who was a firm believer in the identity of the poisons of syphilis and gonorrhoea: but this idea, and the hypothesis about the impossibility of any spontaneous cure of venereal sores, are now very generally relinquished.

The first symptoms of gonorrhoea is generally an itching at the neck of the urethra, sometimes extending over the whole gland. A little itching of the lips of the urethra, the effect of inflammation, is next observable, and soon afterwards a running appears.

The itching changes into pain, more particularly at the time of voiding the urine. There is often no pain till some time after the appearance of the discharge and other symptoms; and in early gonorrhoea there is hardly any pain at all even when the discharge is very considerable. At other times, a great degree of soreness extends long before any discharge appears. There is generally a particular soreness in the penis, and more especially in the glans. The glans has also a kind of asperity, especially near the beginning of the urethra, where the skin, being dissipated, searred, and red, resembles in appearance the mouth of the urethra is, in every situation, redly inflamed. The surface of the glans itself is often in a half-suppurated state, consequently very tender; and it secretes a sort of discharge. Venereal infection is likewise glaucous, which is known by the stream of urine being purpler than common. This proceeds from the fluid of the penis in general, and either from the lining of the urethra being inflamed, or in a venereal state. The heat of the patient while voiding the urine, when disposed the urethra in contrast, and the stream of urine is generally much heated and broken as soon as it leaves the passage. There is frequently some degree of hæmorrhage from the urethra, perhaps from the defect on the membrane, more especially when there is a discharge, or a tendency to it. Small swellings often occur along the inner surface of the penis,

in the course of the urination. These Mr. Hunter ascribed to be enlarged glands of the passage. They are constantly suppurated and larvee extremely, but are confined to the urethra itself. Mr. Hunter has also supposed such eruptions to be due to the venereal virus, glands of the urethra themselves with venereal infection of the parts of the duct being closed, in a venereal manner to what happens in the duct leading from the lacteal sac to the testis, and so on to induce inflammation, suppuration, and abscesses. Hemorrhage and swelling may also occur in the dilation of the penile glands, and end in considerable abscesses in the perineum. This latter abscess is best treated internally or externally, and sometimes in both ways, as in a gonorrhoea female is perineum.

A sinus is often left all along the inner side of the penis, frequently extending as far as the anus. The sinus is particularly great in children; but the same differs from children by the penis following straight. In most cases of gonorrhoea, external abscesses and even sometimes fistulas to the testis, are sometimes of great service. Mr. Hunter thought that they were formed to suppose them of venereal origin.

The natural history descends from the glands of the urethra is first changed from a dry, transparent, watery secretion to a viscid, whitish fluid; and the burning heat which the passage naturally retains becomes less transparent; with these symptoms, however, are usually the pain, burning, more and more the quantity of common pus.

The matter of gonorrhoea often has a peculiar color and consistency, sometimes from a virus in a pure, and often to a great extent. These changes depend on the increase and decrease of the inflammation, and on the poisonous quality of the matter itself; for an irritation of these parts, equal to that produced in gonorrhoea, will produce the same appearance.

The discharge is produced from the urethra (and the urethra, and from the lacuna), but is never more than about two or three inches long, in extreme cases. Mr. Hunter says, seldom farther than an inch and a half, or two inches at most. This he takes the quantity of the inflammation. Whenever he begins to examine the urethra affected with gonorrhoea, he always found the lacuna closed with mucus, and more visible than in the natural state. Sometimes it is so enlarged that it is almost completely closed; and the discharge goes from the whole surface of the urethra, and even from Cowper's glands, the prostate and vesicular seminales.

But if the matter were secreted from all these parts, the pus would collect in the bulb, on the scrotum, and thence be emitted in jets; for looking into it in the bulbous part of the urethra without examining it to touch, especially when in a state of irritation and inflammation.

When the inflammation is violent, some of the vessels of the urethra often burst, and a discharge of blood occurs. Sometimes such blood is only put on to give the matter a tinge. In other instances, rectum causes an extravasation by obstructing the urethra.

When the inflammation goes more deeply than the membranous lining, and affects the cellular membrane of the urethra, it produces in it an enlargement of considerable length, the consequence of which is a chancre. (See *Chancre*.)

Mr. Hunter supposed, that the disease is communicated or creeps along from the glans to the urethra, or, at least, from the lips of the urethra to its inner surface, so it is impossible that the infection could not, being rubbed, get as far as the disease extends. He mentions an instance, in which a gentleman who had not been treated with any violent or many means, in all appearance caught a gonorrhoea from a piece of paper, which had adhered to his glans penis in a venereal sore. The infection is accounted for, by supposing that some virus with a clasp had previously been to the place, and had left behind some of the discharge, and that the above gentleman had allowed his penis to remain in contact with the matter till it had dried.

Many symptoms depending on the sympathy of the parts with the urethra sometimes accompany a gonorrhoea. An hæmorrhoea, consisting of venereal and just, and a kind of watery, are felt about every part of the penis. The venereal, venereal, perineum, anus, and legs become disagreeably sensitive, and the urethra often appears to be squagled. An irritable, inflamed,

they in such a way, that the least accident, or even exertion, which would have no effect on this kind at another time, will make them swell. The glands of the groin are often affected sympathetically, and even swell a little, but they do not suppurate, as they generally do when they inflame from the secretion of matter. Mr. Hunter has seen the irritation of a gonorrhoea so extensive as to affect not only the thighs, buttocks, and abdominal system, but have even produced the fever, had a gonorrhoea without being attended with increased venereal pain.

When the disorder, however, of the urethra from sympathy is become violent than has been described, Mr. Hunter termed it a *caput, or species ventralis, gonorrhoea*; but if the patient is very susceptible of such irritation, or of any other kind of which which may excite the venereal, then the symptoms are in proportion heightened. In such circumstances, we sometimes find the irritation and inflammation extend the specific disease, and creep through the whole system. There is often a considerable degree of pain in the perineum; and a frequent, though not constant, erythema is a symptomatic indication of this secretory system and mucous membrane. In these cases, the inflammation is sometimes considerable, and goes deeply into the cellular membrane, but without producing any effect except swelling. In other instances, it goes on to suppuration, thus becoming one of the causes of fistula in perineum. Thus, Gouper's glands may suppurate, and the irritation often spreads from the bladder itself.

When the bladder is affected, it becomes more susceptible of every kind of irritation. It will not bear the least disturbance, and therefore the patient sometimes has water in his urinary tube, and the constant desire of making water takes place; he is obliged frequently to make it, and makes pain in the bladder, and sometimes in the groin, exactly similar to what happens in a fist in the groin. If the bladder be not allowed to discharge its contents immediately, the pain becomes almost insupportable; and even when the urine is evacuated, there remains for some time a considerable pain back in the bladder and groin.

Sometimes, though rarely, when the bladder is much affected, the ureters, and even the kidneys sympathize; and Mr. Hunter has reason to suspect that the irritation might be communicated to the peritoneum by means of the vesiculae.

Mr. Hunter mentions a case, in which, while the inflammatory symptoms of a gonorrhoea were abating, an inflammation of this case on, but in little proportionately well.

A very common symptom attending a gonorrhoea is a swelling of the testicle.—(*See Nerve Hæmorrhoides*.)

Another accidental consequence is a sympathetic swelling of the inguinal glands.—(*See fistula*.)

A third kind is sometimes observed, leading from the glands along the back of the penis, and then directing its course to one of the groins, and affecting the glands. At the part of the groin where the cord takes issue, there is just commonly a swelling. This sometimes happens when an evacuation and a discharge from the penis or glands take place. In one case, Mr. Hunter thought the large vein in the dorsum of the penis was inflamed and thickened.—(*On the symptoms affecting the Secretion and Excretion of the Urine, &c. p. 264.*)

From the above account, the symptoms of gonorrhoea in different cases seem to be subject to infinite variety. The risk here often appears without any pain, and the coming out of the urine is not at all hindered, and after the usual time of the discharge. There is often no pain at all, although the discharge is in considerable quantity, and of a bad appearance. The pain often goes off while the discharge continues, and will return again. In some cases, as I think is not a considerable time, which is sometimes succeeded by pain; though in many cases it continues all the way to the cure. At the same time, the pain is often troublesome and considerable, even when there is little or no discharge. The neighbouring parts sympathize, as the glands of the groin, the testicle, the liver and spleen, the upper part of the thighs, and the abdominal muscles. Sometimes the disease spreads a few hours after the application of the poison, sometimes not till six weeks have elapsed. Lastly, it is often applicable to diseases whether the case is a venereal discharge, or rather was

produced by the application of infectious matter, or only an accidental discharge, arising from some unknown cause.

GONORRHOEA IN WOMEN.

The disorder is not so easily ascertained in women as in men, because they are subject to a *discharge called fluor albus*, which resembles gonorrhoea. A more discharge in women is less a proof of the existence of a gonorrhoea than even a discharge without pain at men. The kind of matter does not enable us to distinguish its condition from a *fluor albus*; for in the latter affection, the discharge often puts on all the appearance of venereal matter. There is no necessary pain, and therefore no reason of disturbance. The appearance of the parts often gives us but little information; for he says Mr. Hunter, I have frequently examined the parts of those who confessed all the symptoms, such as increase of discharge, pain in making water, burning in walking, or when the parts were touched, but I could see no difference between these and *fluor albus*. I know of no other way of judging, in cases where there are no symptoms visible in the person herself, or where the patient has a wish to deny any venereal symptoms, but from the circumstances preceding the discharge; such as having been connected with men supposed to be infected, or her being able to give the disorder to others; which last circumstance, being derived from the testimony of another person, is not always to be trusted in her private remark. But though there may sometimes be great difficulty in forming a judgment of some of these cases, the surgeon may frequently come to a right conclusion, by considering, as Mr. Hunter has suggested me, that, besides the difficulties depending on the constantly severe symptoms of gonorrhoea, that always may be shown by the great debility; the swelling of the stomach; the weakness of the limbs; the pain of the back, always increased by the erect posture; the severe hæmorrhoids; the painful menstruation; together with the very gradual nature of the disease.

From the manner in which the disease is contracted, it is not principally attack the system, a just and allowed with much probability. In many cases, however, it produces a considerable laceration in the inside of the labia, vagina, clitoris, external os, and sometimes the urethra. In certain cases, these parts are so sore, that they will not bear to be touched; the patient can hardly walk, the urine gives pain as it passes through the urethra, and when it comes out it is often with the above-mentioned pain.

The bladder, and even the kidneys, occasionally sympathize. The mucous glands on the inside of the labia often swell, and sometimes suppurate, forming small abscesses, which open near the orifice of the vagina.

According to Mr. Hunter the venereal matter from the vagina sometimes flows down the perineum to the anus, and produces a gonorrhoea or chancre in that situation. The disease in women may probably wear itself out, as in men; but it may exist in the vagina for years, if the testimony of patients can be relied on.

TREATMENT OF GONORRHOEA.

As every kind of the venereal disease is supposed to arise from the same cause, and as we have a specific for some forms, we ought to expect that there would be a certain cure for every one; and therefore, that it might be no difficult task to cure the disease, when in the form of inflammation and suppuration on the urethra. Experience teaches us, however, that the gonorrhoea is the most variable of all symptoms, which leads a cure; and the most uncertain, with respect to its cure. Of the period of the venereal disease, if it ever be a large of this disease at all, many cases continuing a week, many others continuing months under the same treatment.

The only curative object is, to destroy the inflammation and specific mode of action in the parts of the penis, and as they become changed, the poisonous quality of the matter produced will also be destroyed. This affects the cure of the disease, but does not always remove the consequences.

Gonorrhoea is incapable of being continued beyond a certain time in any constitution; and when it is violent, or of long duration, it is owing to the part being very susceptible of such irritation, and readily receiv-

ing it. As no specific remedy for gonorrhoea is known, it is fortunate that one alone will effect a cure. It is worthy of consideration, however, whether medicine can be of any service. Mr. Hunter is inclined to think it not of the least use in more cases than of ten. But even this would admit some consequence, if the cause capable of being benefited could be distinguished.

The nature of cases generally adopted are of two kinds, internal remedies and local applications; but whether pain is primary, we are always to attend more to the nature of the constitution, or to any accompanying disease in the parts themselves, or some combination with them, than to the gonorrhoea itself.

When the symptoms are violent, but of the ordinary inflammatory kind, known by the course of the inflammation not exceeding the specific duration, the local treatment may be either trying or soothing.

According to Mr. Hunter, irritating applications are less disagreeable in these cases, though irritative inflammation is possible, and they may alter the specific course; but as produce this effect their intention must be greater than that of the secreted matter. The parts will afterwards recover of themselves, as soon as the ordinary inflammation.

Mr. Hunter believes, however, that in the beginning the soothing plan is the best. If the inflammation is great, and of the irritable kind, no violence is to be used, for it would only increase the symptoms; and getting should be done that will lead to stop the discharge, as it would put out a stop in the inflammation. The constitution is to be altered, if possible, by remedies adapted to the disposition, and following the disease to its simple form. If the constitution cannot be altered, nothing is to be done, and the action is to be allowed to wear itself out.

When the inflammation has abated, the cure may be completed by internal remedies or local applications which do not operate violently, whereby the irritation might be reproduced. Gentle stimulants may be applied.

But, if the disease has become violent, an irritating injection may be used, in order quickly to get rid of the specific mode of action. The application will increase the symptoms for a time, but when it is left off they will often abate or wholly disappear; and after such slackening stimulatives may be used, the discharge being the only thing to be removed.

When taking pain, and other incoercible difficulties are felt for some time before the discharge appears, Mr. Hunter sufficiently expresses his inclination to recommend the soothing plan, instead of the irritating one, in order to bring on the discharge which is a step towards the resolution of the inflammation; and he holds that to use stimulatives would be bad practice, as by increasing the discharge they would only prolong the cure. When there are strictures or excruciating vesicles, stimulatives should not be used; for while there is a discharge such complaints are relieved.

Mr. Hunter thus expresses himself in regard to the effect of mercury in gonorrhoea: "I doubt very much of mercury having any specific virtue in this species of the disease; for I find that it is too soon cured without mercury as with it, &c. Soluble effluvia, I believe, has the greatest effect in gonorrhoea, that I have known a gonorrhoea take place while the subject was under a course of mercury sufficient for the cure of a chancre. Now have also been known to contract a gonorrhoea when loaded with mercury for the cure of a chancre; the gonorrhoea, nevertheless, has been so difficult of cure as to endanger life."

Mr. Hunter does not say much in favour of evacuations, diuretics, and antispasmodics given internally. He disposes, however, that cathartics, given not specifically on the parts, as the balance compared with any other medicine which may be thought right, may help to lessen the discharge, in proportion as the inflammation abates.

Local applications may be either internal by the urethra, external by the penis, or both. Those which are applied to the urethra seem to produce most efficacy, because they come into immediate contact with the diseased parts. They may be either in a solid or fluid form. A fluid is only a very temporary application. The solid ones, or bougies, may remain a long while; but as gonorrhoea abates infrequently, from their solidity alone; and Mr. Hunter says, the few bougies are used when the parts are in an inflamed state."

though he never saw any bad effects from them, while applied with caution.

At present bougies are rarely used in cases of gonorrhoea, in consequence of the irritation which they produce, and their tendency to bring on a return of the disease.

The fluid applications or injections are less so, and more gentle; and as gonorrhoea frequently gets into such so many of various kinds, we may infer that the same plan would, in time, get well of itself. However, there remains to be done that injections when used have no immediate effect on the symptoms, and hence may have power) though the injection which produces the greatest power is unknown. As injections are not necessary applications, they must be used when, especially when found useful, and not of an irritating kind.

Mr. Hunter divides injections into four kinds, the anodyne, sedative, resolvent, and astringent. According to his doctrine, irritating injections of every kind act in this disease upon the same principle; that is, by producing an irritation at another part, which could be greater than the venereal; by which means the venereal is destroyed and lost, and the disease cured, although the pain and discharge may be kept up by the injection, effects a benefit, which may soon go off when the injection is laid aside. In this way bougies thus produce a cure. Most of the irritating injections have an astringent effect, and give simple treatment when used.

Irritating injections should never be used when they are already much inflammation; especially in constitutions which are liable to be irritated by any such irritation: nor should they be used when an inflammation has spread beyond the specific disease; nor when the vesicles are tender. But when used the discharge coming quickly, these parts have become dry, and when the permanent is very symptomatic of inflammation, and especially if a further should have occurred; nor when there is a tendency to the discharge to irritation, known by the frequency of having water.

In mild cases, and in constitutions which are not irritable, such injections often succeed, and however the disease abates immediately. The phlegm, however, ought to be stopped with cathartics, and not cathartics, till milder methods have failed. Two grains of the jalapineum catharticum, dissolved in eight drops of distilled water, form a very good irritating injection; but an injection of only half this strength may be used, when it is not attended by attended a cure or cure. If, however, the injection, even in this quantity, produces considerable pain in its application, it becomes a prodromic of pain in making water, it should be better avoided.

Sedative injections will always be of service when the inflammation is considerable, and they are very useful in removing the pain. Perhaps the cathartics is again, as well when given by the rectum as when, as when applied to the part affected in the form of an injection. But even opium will not act as a sedative in all constitutions and parts; but, in the majority, short but opposite effects, producing great irritation. Local may be rendered sedative, so far as it would be, flammable, while at the same time it may act as a gentle stimulant. Fourteen grains of opium dissolved in 3vj of distilled water, make a good sedative or anodyne injection.

Diluting body of distilled liquor may, however, be a sedative effect, as it in part removes some of the causes of irritation, by reducing the extent and duration to the bladder when the irritation is there, and so the system is less pained thereby. It does directly may possibly lessen the susceptibility of irritation. The vegetable purgatives of certain seeds are painless, and the cooling ones are astringent. Mr. Hunter does not entertain much opinion, of their efficacy, though some of his patients that have had very experienced less success in making water, when their drink was impregnated with such vegetable substances.

Emollient injections are the most good when the inflammation is very great; and they produce an effect, first, simply by washing away the matter, and then by a soft application to the part, so as to be singularly or visibly by lessening the irritating effects of the disease. Indeed, practice proves this; for a solution of gum arabic, milk and water, or sweet oil, will often lessen the

pass and other symptoms, when the more active ingredients have done nothing, or cannot be so done.

The irritation at the orifice of the urethra is frequently so great that the pain of the syringe cannot be suffered to enter. In this case, an injection should be used till the inflammation has abated; but, in the mean while, fumigations may be employed.

Antiseptic injections act by lessening the discharge. They should only be used towards the latter end of the disease, when it has become mild. But if the disease should begin mildly, they may be used from very beginning; for by gradually lessening the discharge, without increasing the inflammation, we regulate the cure, and prevent a continuance of the discharge called *gleet*. They will have an irritating quality if used strong, and hence increase the discharge, instead of lessening it. Mr. Hunter's experience did not teach him that sea storages was much better than another. The strongest gales, as tragacanth, blood, the balsam, and the vegetable, directed to water, the juice of many vegetables, as oak bark, Peruvian bark, camellia root, and perhaps all the astringent salts, as cream, blue, and white vitriol; the salts of mercury, and also zinc; probably affect much in the same way; though the more changing of all injections is often efficacious. The local use of the little seed properly diluted, has been recommended by Vaguet, Thuillier, and others, as a safe remedy for the stoppage of gonorrhoea. (See *Précis on the Effects of various Articles in the Cure of Gleet*, Vaguet, 1760, vol. 1; and *Nouvelles Méthodes*, Thuillier, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 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3731, 3

epithelial plantar on the palm, or the burn, where the surface of the bladder originates; or, a small blister on the perineum. In another place he mentions lock, stricture, urethra, and gonorrhoea, among the proper causes.

See Med. Testimon. See Herma's Materials.

For a more full account of gonorrhoea, according to the above authorities, see *A Treatise on the Venereal Disease*, by John Hunter, from page 59 to 66.

ON THE QUESTION WHETHER GONORRHOEA IS EXALAN A FORM OF THE VENEREAL DISEASE.

The foregoing remarks, and others in Mr. Hunter's work, would lead one to believe, that the poison of gonorrhoea and the venereal virus are the same. Here it is my duty especially to state the arguments which have been urged for and against this important question.

Mr. Hunter assumes, first, that he has seen all the symptoms of less venereal origin than gonorrhoea; and, that he had even produced venereal diseases by inoculating with the matter of gonorrhoea; and that he afterwards repeated these experiments in a manner in which he could not be deceived.—(P. 20, *et seq.*)

Mr. Hunter's experiments, it is true, have been repeated with a different result; but, as a late writer has remarked, may we wonder at this, when we consider from how many causes gonorrhoea may arise, and how impossible it is to distinguish the venereal from any other?—(On the Venereal Disease, by A. Adams, M.D. p. 56, ed. 2.)

Another argument advanced by Hunter, in favour of the poison of gonorrhoea and chancre being the same, is the probability that the Ottomans had the venereal disease propagated to them by European sailors, who were afflicted with gonorrhoea; for these men usually supposed to have had a chancre during a voyage of five months, without the penis being destroyed.

It is impossible, however, to say what time may elapse before the application of the venereal poison to the parts and the commencement of the ulceration. Therefore, Roushew's sailors, attacked by Mr. Hunter, might have contracted the infection in Rio de la Plata, but actual ulcers on the penis might not have formed till about five months afterward, when the ship arrived at Oran.

In answering to explain why a gonorrhoea and a chancre do not equally produce less venereal, and why the medicine which almost universally cures chancre has no effect on gonorrhoea, a modern advocate for Mr. Hunter's doctrine says, that we must take into consideration, that the sort of the two diseases is different; that the same cause may produce different effects upon different parts, that the same poison, when mixed with different fluids, may be more or less violent in its operation; and that there may be greater or less attraction of certain fluids to a part, according to its sensibility and disposition.—(Lectures on the Venereal Disease, by A. Adams, M.D. p. 4.) Mr. Adams says truly, however, p. 6, that if the physician could neither hit clearly and distinctly marked chancre, nor accommodate the system to any one medicine, the question is complicated. It would be no instance, produces these effects, unless it had the power of doing so. This writer arrives toward some cases to prove, that the poison of gonorrhoea may produce gonorrhoea or chancre; but the point of this work only affords room to observe that these instances are by no means decisions of the point, because some objections may be urged against them, as indeed Mr. Harvey himself allows. That Mr. Hunter's cases are inconsiderable, I have previously endeavored to explain in the last edition of the *First Lectures on the Venereal Disease*.

Why does not gonorrhoea occasionally produce ulceration on the penis? Mr. Harvey tries to solve this question by saying, that the product of the venereal inflammation, the dissolved contents of the small vessels of the urethra, are thrown out of these open-mouthed vessels into the canal, without any breach of these vessels, which otherwise would be a necessary consequence.

Why does not gonorrhoea equally communicate the venereal infection? In gonorrhoea, says he, however, the discharge is very plentiful; it is not, in general, attended with ulceration; the poison is much more watery, and mixed with a mucus and particles that, if it is deposited in the urethra and its branches, where

little or no pressure is applied, and it flows easily out of the canal. In chancre, there is a breach of the vessels, the poison is not easily chased, &c.

Why does not chancre generally in the same young produce gonorrhoea and venereal infection? Mr. Harvey, in answer, expresses his belief, that these diseases are not very frequent. He says, in his known persons having a chancre, which continued for months, became affected after that time with a chancre without any further exposure. He supposes it, that the matter of the chancre had introduced itself into the vessels and produced the chancre; though he reasons, many would explain the circumstance by assuming that these diseases and gonorrhoea were both venereal, and that the same time by two different poisons.

Mr. Harvey assumes, that the products of the venereal inflammation the adjacent parts less susceptible of the influence of the other.

Mr. Harvey concludes his second chapter with insisting on the idea, that the matter of gonorrhoea is essentially pus, but of a more purulent nature than that of a chancre. However, when he considers chemical differences, as deriving the poison from these is the matter, and from pus to the dry parts, it is not to explain the last of the above questions, every one must find more than a work which contains some sensible observations should comprehend this most remarkable case.

Mr. Whistly also supported the opinion, that the matter of gonorrhoea and that of chancre are the same.—(On Gonorrhoea Venerea.)

Another defender of this side of the question is Dr. Brederick, who endeavours to prove the identity of the following positions: 1. That the poison which produces the chancre does also, like the chancre, produce any venereal symptoms on the testis, or less likely. 2. That the poison of the chancre produces chancre, and that the poison of chancre produces a chancre. 3. That ordinary cases of chancre, if not accelerated, the cure of a chancre; but that, in its ordinary, every chancre may be cured and without mercury, and without any danger of forming a chancre.

His arguments run thus:—The poison which causes the chancre, occasionally produces the chancre, and that most of them exists only a superficial inflammation in the membrane of the testis, without any chancre. Hence, chancre cannot easily take place, the poison being out of the centre of the inflammation. And he has seen chancre with no other in the testis, followed by the most dangerous symptoms of chancre. He mentions the urethra being affected with a large quantity of matter, so the thing depending the common disposition of matter, which is occasionally more when the matter is not secreted outward, or is voided with the urine, that in many cases, where he had reason to believe both parties, he was convinced that the chancre was communicated by a person affected with a simple gonorrhoea, and vice versa, that a chancre had been the consequence of an infection from a person having merely chancre. He says that if a patient with a venereal running chancre did not take care to keep the prothod and glass perfectly clean, chancre will very often be produced. He seems a great enemy to the cure without mercury; yet, repeated experience has shown him a more certain, he always has accomplished. Mild cases, without chancre or ulceration in the urethra, may certainly be cured with mercury, and a great deal of mercury; and though mercury should be given, it would not have the least effect, not because the disease does not proceed from the venereal poison, but because it is out of the course of the circulation. He concludes, that the general use of mercury in injections will surely cure in these cases. But when a chancre is joined with ulceration in the urethra, it is always cured more easily and expeditiously with mercury, and is properly curable without it. A few also history cases attended with ulcers in the urethra. He allows, that all cases are not venereal without mercury. (On Venereal Diseases, by A. Adams, M.D.)

One argument urged against the identity of gonorrhoea and chancre is, that gonorrhoea was described as a symptom all nearly half a century after the whole symptoms of the venereal disease were known. Physicians are aware the fact that gonorrhoea is a symptom of the venereal disease. "If, however," says Dr. Adams, "venereal gonorrhoea was quoted

all about fifty years after the first forms of the disease were described, when does this prove, but that gonorrhoea was so common as to be disregarded as a symptom of the new complaint? Can there be a doubt, from the caution given by Meigs, that gonorrhoea was considered as contagious in his days? During the classical age, we find inaccuracies in the arbitrary passages were applied to inflammation; and the policy of several states, before the siege of Naples, made laws for preventing the health of such as would pass themselves with public works instead of discharging the duties of soldiers.

This is enough to lessen our surprise that gonorrhoea should be considered for long time after the appearance of the venereal disease. But we far less from proving that the two infections are different, that the former infection may not draw its origin from their identity. For if by this time the venereal disease began to be so far understood, that secondary symptoms were found the consequence of primary ones in the genitalia, it is most probable, that the first suspicion of venereal gonorrhoea arose from the occurrence of such secondary appearances, whose far other primary symptoms could be traced.—Adams, on Medical Jurisprudence, p. 56, et. 23.

In visiting the arguments maintained by the best modern writers to repel the attacks made on the doctrine that gonorrhoea and chancre arise from the same source, we have been compelled to discuss the solid grounds on which the opponents venture to maintain a contrary theory.

The arguments of Mr. H. Bell are quite at variance with those of Huxham, Sawrey, Swedmark, Adams, Havers, &c.; but my limits will only allow me just to enumerate a few of his leading arguments.

If the matter of gonorrhoea and that of chancre were of the same nature, he contends which that person with a chancre only can communicate to another, not only every symptom of gonorrhoea, but of gonorrhoea; and that matter, with gonorrhoea only, can give to all with whom he may have connection, chancre, with their various consequences. This might indeed be a very frequent occurrence; whereas all allow that it is even in appearance very rare.

On the supposition, that the matter of gonorrhoea and chancre being the same, the latter ought to be a much more frequent occurrence than the former, from the greater ease with which the matter of infection may, in every instance, be applied to those parts as well as to the produce chancre, than that of the chancre, where, instead of chancre of infection, it almost always creates gonorrhoea. It is difficult to conceive how the matter, by which the disease is communicated, should be so common to the venereal; while at the same time the parts, particularly the penis, least exposed to it, and yet gonorrhoea is a much more frequent disease than gonorrhoea. Cases of gonorrhoea are in proportion to those of chancre, according to Mr. H. Bell's experience, at times in ten to one. It is evident that the very reverse should happen, if the two diseases were produced by the same kind of matter.

I need not adduce other arguments, as the reader must be already acquainted with any worth knowing, from what is said in the previous part of this article.

The great practical recommendation depending on the possibility of the venereal disease arising from gonorrhoea, whether necessary should not be neglected, in all cases, with the view of preventing such a consequence.

Writing, on my own part, all attempts to decide the point, whether the matter of a chancre and that of one of gonorrhoea are of the same nature, I shall merely content myself with stating, that, so far as my observation and inquiries extend, the majority of the two practitioners of the present day consider the exhibition of mercury unnecessary and consequently improper, in all cases of gonorrhoea. This fact almost amounts to a proof that, if venereal symptoms do ever follow a chancre, they are so rare, and I may add, always an irreparable badler comes, that the employment of mercury, as a preventive, would ruin the whole, do more injury than benefit to mankind; and this even admitting (what to my mind has never been universally proved) that the matter of gonorrhoea is really passing, in a very few instances, of giving rise to the venereal disease.

The reader must weigh the different arguments himself. Some of Mr. H. Bell's reasoning is certainly untenable, as Mr. Henry has clearly shown; but the latter also is not infallible in many points, which he strives to defend.

J. Bellon, *An Essay on the Theory and Cure of the Venereal Gonorrhoea, and the Diseases which happen in consequence of that Disorder*, 8vo. Lond. 1777. J. Nevil, *A Description of the Venereal Gonorrhoea*, 8vo. Lond. 1784. J. Norman, *Sketches of the Venereal Syphilis, or Gonorrhoea, with an Account of the Efficacy of Plummer's Alterative Pills*, 8vo. J. Chubb, *An Essay on the Venereal Venereal, in which the different Opinions respecting the Treatment of the Disease are carefully examined*, 8vo. Lond. 1790. W. Thomas, *An Essay on Gonorrhoea, with some Observations on the Use of Opium in the Cure of that Disorder*, 8vo. Lond. 1796. A. Treatise on the Venereal Disease, by J. Hunter, 1796. W. Henry, *The most correct Account of the Venereal Gonorrhoea, as should be handled*, 8vo. Lond. 1800. J. H. G. Schlegel, *Venereale oder Syphilis des Strichs oder der Blenorrhoe des Penis und Tripperkrankheit*, 8vo. Jena, 1796. Wessely, *on the Venereal Venereal*, 8vo. Lond. 1801. Pratt, *on Venereal Complaints*, by E. Simpson, M.D., 2d. ed. 2. *An Inquiry into some of the Effects of the Venereal Poison*, by R. Sawrey, 1802. G. on Medical Jurisprudence, by J. Adams, M.D., 2d. ed. 1807. J. C. Jaubert, *Démonstration de l'identité des Virus de la Vénère et de la Syphilis*, 8vo. Bruxelles, 1801. J. F. Hermandier, *Essai Analytique sur la Nature et les Effets des Virus Gonorrhoeiques et Syphilitiques*, 8vo. Paris, 1802. R. Comenius, *Essays on the Venereal Disease which have been communicated with Syphilis*, 8vo. Lond. 1814; and his *on the Syphilis and Syphilitic Disturbances of Venereal Disease*, 8vo. Lond. 1815. John Wesley, *on Complaints affecting the Venereal and Syphilitic of the Urine*, 8vo. Lond. 1822.

GORGENT, An instrument used in the operation of lithotomy, for the purpose of cutting the prostate gland and neck of the bladder, so as to enable the operator to introduce the forceps and extract the stone. It is, in fact, a sort of knife, at the end of which two hook-like pins the groove of the staff and blades of being pushed into it into the bladder.

Besides cutting pipes, continued by the growth, the design, there are also many more, intended to be introduced into the urethra, when their capacity serves as a guide for the forceps into the bladder.

GRANULATIONS. The little, gran-like, fleshy bodies, which form on the surfaces of ulcers and surrounding wounds, and serve both for filling up the cavity and bringing together together and healing their sides.

We need not describe the operations of nature, in bringing parts so nearly as possible to their natural state, where disposition, action, and structure have been altered by accident or disease. Having found parts irreparably broken to form new matter upon surfaces in which there has been a breach of continuity. This process is called granulation, or incorporation, and the substance formed is called granulation tissue.

Granulations are an secretion of animal matter upon the wounded or exposed surface. They are formed by infestation of the compound epithelium of the wound; and when new substance has not been very fully supplied, and in which new cells are formed. Hence, granulations are extremely vascular; indeed, more so than almost any other natural substance. "That this is the case," says Mr. Hunter, "is open to every eye." I have often been able to trace the growth and vascularization of granulation substance. I have seen spots a few weeks before, perfectly smooth, in every visible respect, to granulation tissue. I have not attempted to pull it off, and the next day of drawing I have found it was very substance was very soft, by rubbing or touching it with a probe, it has been freely. I have observed the same appearance on the external of a bone that has been laid bare. I have removed off some of the external surface of a bone of the hand, to see if the surface would granulate. I removed the following day, that the surface of the bone was covered with a white substance, having a form of bone. When I passed my probe into it, I did not find the bone bare, but only its substance. I introduced the

substance to be impossible lymph thrown out from inflammation, and that it would be forced off when absorption ceases; but on the succeeding day I found it vascular, and appearing like healthy granulations." The vessels in granulations pass from the original parts to their bases, and thence towards their external surface, in loosely regular, parallel lines. The surface of the new substance has the same disposition to contract just as the parts which produced it. The surface of granulations are very convex, are covered of themselves, having a great many small points of elevation, so as to appear rough. The smaller earthy particles, the most healthy earthy granulations. The colour of healthy granulations is a deep fawn red. When dried, they are whitish, and have only a light brown surface. Healthy granulations, when exposed to air, rapidly lose their colour with the surface of the surrounding skin, and when a little higher, but when they dried, they are white as a growing disposition, they are healthy, become soft, suppurate, and without any disposition to form skin. Healthy granulations are always found to be in such cases, so as to be the result of healing parts.

Granulations are not easily healed, as the skin of an abscess around the surface of the hole.

They are not rendered with the same powers as parts naturally formed. Hence they have healthy absorption denied. Hence they have healthy granulations denied when more are needed, and even when they have been formed, have been explained in the article Consumption.—See *A Treatise on the Blood*, Inflammation, &c. by John Hunter, p. 417, 418, 1794.

It is a question whether granulations can ever be formed without suppuration. Mr. Hunter seems inclined to think that they may occasionally be produced without it, and he supports his opinion by the relation of the formation of a granulated testis, in which he observed a granular substance granulations. Dr. John Thomson, in the third book, declares that he has never seen any thing which he considered as an example of a granulation, and with loss of a granulating surface, where granulation formed.—See *Lectures on Inflammation*, p. 488.

The small process by which the blood vessels, nerves, and ducts of granulations are formed, is still among the vessels of nature. The observations of Mr. Hunter on the subject quoted only to confirm. "The growth of nerves and their development is a first formed from granulations (says Dr. J. Thomson), is a subject of great difficulty with the growth of blood vessels in the same structure. Their development in granulations is preceded by the parts which it is not so quick, making, or wiping, the surface of a new. Even the granulations, which arise from the surface of bone are sensible (a specimen not submitted by Mr. Andrew Cooper, though he is not very well able to prove the sensibility of the larger branches of nerves, from which the newly formed and sensible nerves and elements in the granulations are immediately derived. All the difficulties which I formerly mentioned to you, as occurring in the explanation of the nature in which vegetable lymph or granulations are produced with blood vessels, present themselves to me now. We begin to reflect on the matter in which the same granulations are produced with nerves, and these difficulties are still increased, when we suppose that the same granulations are in the state of a few fibres provided, not only with blood vessels and nerves, but also with a system of absorption. The existence of ducts in granulations is proved not only by the changes of such matter as are these daily changes, becoming granular, in the healthy state, and then, when and more compact, but also, by the frequent changes in white or in part of a granulating substance in the process of absorptive absorption."—See Thomson's *Lectures on Inflammation*, p. 419. According to Mr. Andrew Cooper, granulations which spring from parts united with great sensibility, the granulations are extremely sensitive; but granulations which arise from bones, he says, have no sensibility whatever. These observations are qualified with the condition, that the bone be uninfected, and it is acknowledged, that granulations arising from the calcified structure of bones are sometimes extremely sensitive. He describes granulations from bones as quite insensible, and those from synovial membranes as possessing very little sensibility.—See *Lectures on*

1, p. 222. Every young doctor of some of us knows who has been too active of the red prescription system, and has learned from experience, that granulations are diminished with absorbent, venous, and the mercury just be absorbed from the surface of skin, and being in an exhausted-for solution of the parts. It is observed by Mr. Andrew Cooper, that in many cases of ulcers, the granulations are not good absorbent surfaces; but that when the skin has been united a red white, they readily take into the system new granulations which may be applied to them. Thus, when old ulcers are injected with a solution of the acetate of mercury, with the view of stimulating them to heal, the patients are sometimes surprised to see the mercury being absorbed by the system. Mr. Andrew Cooper has seen the same effect produced by the application of the lotion of lime-water and the acetate of mercury in nearly in the nature of ulcers. Indeed, the absorbent power of granulations is frequently the means of producing beneficial effects upon the constitution, by the introduction of dissolved substances into the circulation. Thus, when applied to sores, it often succeeds in the system, and, on this account, it is regarded as a powerful external remedy. Mr. Andrew Cooper gives one instance, in which the patient seems to have been poisoned by the indolent appearance of ulcers, to a fungus of the eye. Ulcers, also, when applied to the surface of sores, in very readily absorbed, producing similar effects to those which arise from granulations upon the stomach. Thus, when the quantity absorbed in two great, extensive ulcers, which were in the head, and beyond of the system, an absorption, which restores the system, and absorption of ulcers granules to their normal.—See *Lectures*, vol. 1, p. 419, 420. A temporary granulation has been known to be produced by the absorption of the tannin of benzoic acid from the surface of a soluble and granular.—See *Thomson's Lectures on Inflammation*, vol. 1, p. 419.

GUALACUM. Many writers of the last century thought this was a very specific in the venereal disease; and the celebrated Boerhaave, in the eighth book, maintained the same opinion. Mr. Pearson mentions that when he was first introduced with the cure of the Lock Hospital in 1751, Mr. Thomas and Mr. Williams were in the habit of giving great confidence in the efficacy of a decoction of gualacum root. This was administered at such doses as had already employed the usual quantity of mercury, but when complained of venereal parts, or of gonorrhoea, syphilis, or other, and such other effects as the venereal virus, connected with secondary symptoms as had not yet had a course of mercurial diseases. The first consisted of rashes and hard swellings; then red blotchy spots of the face were taken every day, the next high was used twice a week; and a course of antimonial wine and barkwater, or Dover's powder, was constantly taken every evening. Decanting infusions of bad was not deemed necessary; but when it was required to the region of having syphilis, with a view of exciting perspiration, often practiced; and only a small dose of the skin was used. This treatment was attended with singular advantage to those, whose syphilis had not failed injury from the disease, ingested, and mercury. The strength increased; but when blood examinations were completed; and then venereal symptoms, which would have been associated to mercury, were yielded to patients.

Besides such cases, in which the good effects of gualacum seemed to be considerably increased in a woman for the first time, the medicine was also found given by some, on the first attack of the venereal disease. The disorder being three months, a woman was considered to be an excellent case, when frequent rashes followed, yet, as these partly refer to the skin (though, in repetition was not left to Mary Thomas also, which got well, with probably the really venereal cases. Mr. Pearson remarks, that, in syphilitic affections, it may, indeed, prove like a true antidote, suspending for a time the progress of certain venereal symptoms, and relieving, as it possesses absorbent; but, in common, the experience has shown that the unabsorbed were performed more to the constitution.

Mr. Pearson would guarantee of little use in case of the bones, except when it proved syphilitic; but that was then sufficient to announce an accident. When the constitution has been injured by mercury failing,

contaminant, a thickened state of the ligaments, or perforations, or fistulous, and suppuration. Mr. Pottson says, these effects will often decide during the restoration of the denervation. He says it will often happen, for a short time, the progress of certain secondary symptoms of the large venous, the gastric, action of the inside, mental irritations, and even hopes. Mr. Pottson, however, never knew any instance, in which patients employed the remedy, and he contends, that the being occupied with necessary business increases the virtue of this remedy, because its bad effects, are diminished. The necessity of giving a sufficient quantity of it. He has seen good effects produced by its use in various diseases, the strict, and sometimes effectiveness of the denervation of ligaments.—(See *Pottson's the History of Pottson's Art in the Cure of Lungs Pottson*, vol. 2, 1807.) Many of the foregoing observations on the causes of gangrene is applicable to the secondary effects of the fact, now so completely established, that the disease is generally capable, in the end, of a spontaneous and lasting cure.—(See *Pottson's* *Journal*.)

GUMMA. A soft tumour, so named from the resemblance of its contents to gum.

GUN-SHOT WOUNDS receive their name from the manner in which they are produced, being generally caused by hard, solid, metallic bodies, projected from cannons, muskets, or some other species of firearm. With such injuries, it is also usual to comprehend a variety of accidental wounds arising from the explosion of shells, or the various small pieces of shrapnel from muskets, or missiles of wood or iron, or large, are driven about. Gun-shot wounds are the most common species of the traumatic kind; and when it is to be said of these, will imply, rage, or loss, in all contused wounds, according to the degree of violence. They are particularly distinguished by what the French surgeons are fond of calling a *shock*, a consequence of this cause. The extensive contusions and fractures accompany gun-shot wounds, depend upon the velocity with which the bodies possessing them are propelled. The parts touched by the ball are immediately converted into a blackish mass, the colour of which must be as extensive as possible, and being produced by gunpowder being kindled, and a small portion of lead with which they come into contact. But reason and experience have now proved, that whatever may be the velocity of a projectile, it never acquires in its passage any perceptible heat. Indeed, a modern writer asserts, that such a degree of heat as would be requisite to make a ball burn parts in its passage, would totally melt it.—(Rush, *Medical Jurisprudence*, vol. 1, p. 217, vol. 2.) In general, gun-shot wounds do not bleed much, unless large blood-vessels be lacerated; the external surface is often livid; and the shock, the stupor, the insensibility, or the labour done to the nerves, may be more or less, as the part is hit, or the force of the blow, or the nature of the body, or the state of the system.

However, as Dr. Hennen most truly observes, "the effects of a gun-shot wound differ so materially in different tissues, the appearances are so various, according to the nature of the part wounded, and the greater or less force with which it has been struck, that no affirmative rules of diagnosis can be laid down as its necessary concomitants. If a musket or pistol ball has struck a fleshy part, without tearing any external blood vessel, we are to have above the size of a marble, that the ball itself will, a night or less, be surrounded by, turned livid; and if it has passed through the parts, we find an external edge, and a more recent and larger defect at the point of its exit. The hemorrhage is in this case very slight, and the pain is moderate, inasmuch that, in severe instances, the wounded part is not worse of the living, nor of any injury. If, however, the ball has lacerated a vessel, or nerve, the hemorrhage will probably be profuse, or the pain of the wound severe, and the power of the part lost. After this we will have a thick crust of coagulated blood, or a crust of pus, which, without exciting the slightest symptoms of heat, or suppurative action; and when they are, they will rarely argue, as the common motto of the theory; while a truly profuse, intense venous, profuse preparation, and universal oedema will arise either on the receipt of a slight shot wound. This tissue, which has been so much talked of, and which is an inexperienced eye is really surprising, is now followed by a menstrual of some of

spots, or by an effusion; but above all by the tenderness and sympathetic nature of the surface, and his observation of the patient's safety.—(Pottson's *Art*, vol. 2, p. 22, vol. 3.)

On the other hand, it is correctly noticed by Mr. Gutter, that the laceration of the constitutional state of a part ought to excite great suspicion of serious injury; and when wounds have been received in such situations, or bear such appearances, or tend to it, it is doubtful whether any part of vital importance has been injured or not, the manner in which the external local perturbation, may be assisted to evidence of the fact, when other symptoms more indicative of the injury are wanting; and under all such circumstances, every extreme measure should be delayed.—(Gutter's *Art*, vol. 2, p. 11, vol. 3.)

Regarding the general character of gun-shot wounds, and to what much as large wounds be injured, it is a fact which necessarily depends upon the degree of violence usually attending these injuries. But it is also true, as the preceding author has stated, that all though some gun-shot wounds bleed but little at first, there is in the greater number of cases more or less of blood, and to wounds of vascular parts, like the face and neck, the quantity lost is often considerable, though the most external laceration may not be deep.—(Gutter's *Art*, vol. 2, p. 11, vol. 3.)

In gun-shot wounds, another circumstance of importance, which is often mentioned in other cases, viz. when a large artery is partially divided, the bleeding is more profuse and dangerous than when the vessel is completely severed, and the hemorrhage, if not stopped by a ligature, or other means, will often interfere with the patient's life. Thus, Mr. Gutter speaks of a case in which life was lost from wounds of the femoral, brachial, and axillary arteries, so divided as to stop the bleeding, the hemorrhage having been stopped.—(p. 11.)

Dr. Andrew Bane introduced some remarks upon the subject of gun-shot wounds, upon the most false, and more highly prejudiced, premises both in their history and treatment, and particularly respecting what have been falsely named *Wound Contractions*. Contractions and being sometimes produce dreadful degrees of injury, without excitation any breach of continuity in the integuments. This observation is so contrary to fact, that the authors and those who usually have read and broken to others, without the least bit of a wound at all. Such cases were for a long while ascribed to the violent muscles supposed to be contracted to the air by the ball itself. It was imagined, that the elastic fluid, being rapidly displaced by the shock of the projectile, was capable of making such pressure as extruding matter, as to destroy their texture. But how could this violent pressure originate in the midst of the open and unobscured air? If this theory were true, the effect in question would constantly happen, whenever a ball passed near any part of the body. The contrary, however, is so much the case, that pieces of soldiers' and sailors' hats, of their buttons, clothes, and even hair are shot away in every battle, without any other noticeable being done.

In consequence of the manner in which such injuries of the soft parts, and even of the bones, attended with any breach in the skin, have been supposed to be produced, they have been erroneously termed *wound contractions*. In fact, these cases are very uncommonly acknowledged by all the most accurate observers to be produced from the cause to which formerly they were always ascribed.

The air does not move with the same velocity as the ball, but its motion is less, in proportion as it is a more elastic matter, and more too little is exerted for such a violent degree of injury. The air in which the ball enters, only communicates its greatest motion in a direct line before it; and will never irritate the part undisturbed by the ball itself. It is only the air displaced laterally by the ball that is supposed to do injury, and it is rather to be greatly admired. The violent consequences of sudden explosions, and the effects produced on the organs of hearing, by strong contractions of the air, prove nothing relative to the point in question. Lastly, experience does not confirm the reality of such *wound contractions*; for cannon-balls often pass all whole members, without the slightest mark being on the most exposed.—(See *Le Voyer*, in *Mémoires de l'Académie de Médecine*, vol. 2, p. 26.)

An eminent professor, who visited the continent for the purpose of seeing the wounded after the battle of Waterloo, fully coincides with M. de Vacher and all the moderns upon this subject. "We saw, and were instructed of many instances in which cannon-balls had passed through the parts of the body, and had removed portions of the vessels and osseous structures, without producing the slightest injury of any kind. In other instances, portions of the body itself were removed by cannon-balls, without the contiguous parts having been truly injured. In one case, the head of the man was carried off by a cannon-ball without respiration being at all affected; and in another very remarkable case, the external part of the ear was shot away, without even the power of hearing being sensibly impaired."—(See Report of Observations made in the British Military Hospital at Brüggen, &c. by J. Trauer, p. 22, Edin. 1816.)

I could cite many more, which I have seen myself, in proof of the truth of Le Vacher's opinion; but the proof is now so universally admitted, that I shall merely add one observation that occurred to the notice of many as well as myself. At the battle of Marston, in 1213, a cannon-shot shattered the legs of two officers, so badly, that the limbs were amputated. These gentlemen were walking at the moment of the accident in the village of Marston, taking hold of the arm of my friend Alexander Simpson, M.D., of the 20th regiment, who was in the middle. Now the ball which produced the injury did not do the slightest harm to the latter gentleman, although it must have passed as close as possible to his lower extremities, and must probably have struck them.

Neither can what have been superficially called wound-contusions be attributed to an electrical shock on the parts, in consequence of the ball being rendered electrical by friction in the caliber of the gun, and being off the mouthpiece as it passes by (vide Francis Richardson, 1. *ibid.*, p. 56); for metals never acquire this property from friction.

The smallest impetus to the air is communicated by the ball itself. Its producing a violent concussion, without tearing the skin and entering the limb, as it is ascribed to the oblique distance in which it strikes the part, or, in other instances, to the resistance with which the ball strikes the surface of the body, in consequence of its having lost the greater part of its momentum, and acted principally by its weight, being, in short, what is called a dead ball. Daily observation evinces that balls, which strike a surface obliquely, do not penetrate, but are reflected; though they may be impelled with the greatest force, and the body struck may be at rest and yielding as water. Thus, therefore, is the course of the ball, not only exposed on the surface of the human body, but also in the substance of a limb which it has entered. Thus, a bone, a tendon, &c. may change the direction of a ball which has taken them at an obliquity. Hence, it is manifest, how it happens that the track of a gun-shot wound is not always straight, and how balls sometimes run along the circumference nearly all round the body or limb.

The causes of several of the peculiarities attending gun-shot wounds are to be sought among the laws by which moving bodies are prevented, not by which the mechanical effect of a ball propelled against any part of the body, must therefore be determined. The form, the momentum, and the direction of the shot that is received; the position, and the variety of structures, or, in other words, the variety of density and powers of resistance, in the part receiving it, must always be considered, in order to account satisfactorily for the effects which it produces. And, though, says Mr. Chevalier, in many cases, a mathematical replication of the course of the ball cannot be given, this same victory gives the want of data, the laws of matter being fixed and invariable. But when the data are known, as, for instance, the velocity and direction of the shot, the position of the patient, or of the wounded part at the time of the accident, and the structure of the parts penetrated, a track may probably be formed, and the course of the ball may generally be formed, then if those circumstances had not been repeated.

On the principle of the density and resistance of parts, attempts have been made to explain the ready absorption of shock, which is given, in many instances, to the whole system by gun-shot wounds,

and which is so represented, by writers on this subject, to be given attended with pain and even alarming effects, extending not only over the injured part, but all during the system at large. Thus, a shot striking against a tendon of a bone, in one of the extremities, will produce a greater commotion than if it struck only against softer parts. A shot striking a muscle is more violent than a commotion than if it struck against the same part of the same muscle at rest; and a shot striking the head of a vessel, the liver, &c., by its violent impact, will generally bring on dangerous commotion of the whole system, with which its direction of these parts are so closely connected.—(V. *Observations on Gun-shot Wounds*, part 1, vol. 1.)

Regarding the mechanical effects of the commotion, I am disposed to think, with Mr. Chevalier, that they have been rather exaggerated, and that in reality a more accurate explanation of the manner of the system might be derived from other considerations.—"A shot during the passage (says he) will cause an instantaneous commotion of the whole system, but the motion effected by the part has little to do with it; it is the loss of the organic functions, indirectly connected with life, that is the cause of the commotion. In this sense, however, I do not conceive, that the general effect of the system depends upon the shock received, but on the effect the injury communicates to the soft parts of the system."—(On Gun-shot Wounds, p. 26, &c.)

A ball, when it strikes a part of the body, may cause four kinds of injury. 1. It may only render a commotion, without penetrating the part, as, in some of its being too much angled, or of the oblique way in which it strikes the surface of the body. 2. It may enter and lodge in the substance of an organ, in which case the wound is usually an aperture. 3. It may penetrate and through; and then there are two openings, one at the entrance, the other at the exit of the ball. The commotion of the aperture, where the ball entered, is usually depressed; that of the opening, from which it came out, elevated. At the entrance, there is commonly more commotion, than at the exit of the ball. The former opening is generally narrower; its rim wider and more irregular, especially when the round smooth figure of the ball has been changed by its having struck a bone. 4. A cannon ball may tear off a whole limb.—(Richard, *Encyclopædia*, art. *Wounds*, &c.)

Gun-shot wounds offer very few kinds, according to the kind of body projected, its velocity, and the nature of the peculiarities of the parts injured. The projected balls are mostly leaden, sometimes tin-plated, sometimes pieces of broken shells, and very often, as I have already said, splinters of wood. The velocity of the motion which the projectile, from the violent passage of the ball through them, there is most commonly a part of the wound surrounding the wound downward, which afterwards thrown off in the form of a spray, generally covering such wounds with lead by the first intention, and looking most of them extremely repulsive. This does not take place equally in every gun-shot wound, nor in every part of the same wound; and the difference commonly arises from the variety in the velocity of the body projected, and where the ball has passed with little velocity, which is sometimes the case at its entrance, but still more frequently at its exit, the wound, the injury may often be limited to the first intention.—(J. Hunter, p. 372.)

And I had the pleasure of reading, in a recent edition of a valuable book on gun-shot wounds, I do not know that, at the present day, any surgeon entertained the idea, that the whole track of a shot, whether it was from a musket, or a cannon, and though it was in a Gun-shot Wound, p. 23, &c. 24; but if (as Chevalier prevails, it is plain from the preceding statements, and the authority of Mr. Hunter cannot be shaken by it) is supposed. At the same time, I believe, that very few surgeons will be inclined to question the statement of Mr. Hunter's account of the spread of a wound, or a degree of commotion, or of the commotion of a part of the nature of a wound, particularly in the vicinity of the entrance of the ball or the exit, or the commotion about the current momentum of the separation of such enough before the parts will be torn, and whether the dead parts be driven off in small fragments with the missile, or larger portions, the fact is still correct.

Foreign bodies were frequently taken in gun-shot wounds from the effects, and the commotion of the

knife. Pieces of clothing or other things with the ball driven into them are found. 2. The ball is soft. 3. Large quantity of blood. It is only when the ball strikes the solid bone, remains in situ, and goes still through the part, that the wound can be then truly fatal. Fracture of bone is the cause of numerous remarkable symptoms, by irritating sensitive parts, and exciting just inflammations, osteitis, osteomyelitis, long suppurations, &c., and the more violent, putrid, and fatal they are, the more likely they are to induce them in us. Hence sprains of bone are generally the cause of it. (See *Fracture*.)

The great company and weight of the bodies produced in the immediate times by gunshot wounds, and such as are so remarkable in any serious case of fracture. When I was with the army in Belgium in the year 1815, I had in my hospital at Brussels several fatal gun-shot fractures of the thigh, caused by rifle-shot wounds. The fracture in some of these cases gave rise to extend two thirds of the length of the bone. This fact is noticed by Mr. Gosselin. "The fracture of the hip artery and below the immediate part struck by the ball, and, so far as the artery is concerned, the fracture downwards than upwards, as that, from a fracture in the middle of the thigh, I have often seen the bone united into the coxal, and even upwards of the entrance of the femoral." &c. (*On Gun-shot Wounds*, p. 138.)

When the ball strikes a bone, the contusion produced is smaller, sometimes, in kind, sometimes, so be added by those directly sustained. When slight, its effects are confined to the injured part; but sometimes they extend to the neighbouring joints, in which they produce inflammation and swelling.

If the sanguiferous vessel is purged of blood, that when a contusion takes off a part, it produces a violent contusion of the whole body, and a general suppuration of all its functions. This, however, is by no means always true. I saw, some years ago in London, a young soldier, whose arm and leg were completely torn off at the shoulder, by a cannon-ball from one of the guns of the Malabar, in Africa, 1805; he suffered no dreadful contusion of his body, nor any ill effects at all appeared. This case was very remarkable, as the wound was so shattered that Mr. Crampton, of Glasgow, was under the necessity of removing the whole of it. The patient recovered in three months. From the foregoing I think I can believe that the arterial injury did not ensue until after the accident. The young man was taken to the assistance of St. Bartholomew's Hospital, quite well.

One curious effect occasionally follows gunshot wounds, but I do not pretend to understand the rationale of it, viz. inflammation and suppuration of unconnected parts, especially of the liver. Mr. Richardson classifies contusions, those the effects of contusions arising from local injury, and contusions arising from striking the middle of the irregular portion in the vascular system in which that system they give rise. He is also of opinion that an explanation of the subject may be deduced from the principles laid down by Mr. Harvey. (*See Med. Cas. Trans. vol. 14, p. 304*.) and Thomas, *Journal* concerning Constitutional Inflammation, Nov. 1825. Several cases of the above nature are related in the *Mem. de l'Acad. de Chirurgie*, and according to Mr. Gosselin many patients in the Division who had extensive vascular aneurysms for gunshot wounds were cured by application of their large artery. &c. (*On Gun-shot Wounds of the Extremities*, p. 14, *et seq.*)

From the circumstances of the liver extending of gunshot wounds being more than 40, less seldom, they are less of it. When the ball has fractured a bone, which fracture has occasioned great injury of the soft parts, independently of that caused immediately by the ball itself, the inflammation will have an as quick an exit as cases of contusion fractures; because the fractured part leaves no room for the formation of coagula in general. (*See* *Med. Cas. Trans.* p. 325.)

From the same circumstances of a part being very vascular, gunshot wounds frequently cannot be completely understood in the first instance, as it may seem it is at first impossible to know what parts are killed, whether bone, tendon, or soft part. Not seldom in such cases the wound separates, much often upon the wound. I have experienced that was previously

noticed. For myself, some vision, and part of some cases, or a part of some large artery, or even a bone has been killed by the violence. If a piece of intestine has been killed, the contents of the bowel will begin to come through the wound with much force. If a portion of a large blood-vessel is killed, a profuse and even fatal hemorrhage may ensue, when the stump is detached, although the material quantity of blood may have been previously lost. (*See* *Med. Cas. Trans.* p. 325.) Thus, several days after the receipt of the wound, and when all danger from inflammation is over, a bleeding peritonitis, occasioned by the separation of a stomach from some internal vessel, may destroy the patient, as happened in a very interesting case recorded by Mr. Gosselin. (*See* *Med. Cas. Trans.* p. 325.)

A soldier of the 21st Regiment of the 54th Highlanders was shot in the foot at the battle of Bergen-op-zoon in 1814. There was no hemorrhage for ten days; but at the end of this period the popliteal artery gave way, and I was obliged to take up the fractured artery, by which means the bleeding was effectually stopped, and the man recovered. This fact, and another related by Baron Boyer (*Annuaire Med. Chir. de Paris*, p. 356, *et seq.* Paris, 1813), prove that a ligature on the femoral artery may satisfactorily check the current of blood through the popliteal artery to put a stop to hemorrhage from a wound in it; and though such pressure is some way from of wasteful pressure is sufficient to arrest the flow of the artery, with which the blood passes through the anastomosis into the part of the wound below the ligature (*see* *Med. Cas. Trans.*), its general causes in gunshot wounds of the foot, would be of infinite advantage, not only as a means of the difficulty of taking up the fractured artery, but its definiteness only defined by the fact, but by a ligature upon the artery and divided parts would frequently have been lost. At the same time I would have suggested always recollect that the important difference between an anastomosis and a wounded artery; for as in the first case there is no real rupture of the vessel, the transmission of the blood into the part of the vessel below the ligature may keep a patient in the hands, but is attended with no risk of hemorrhage; while the same free passage of the blood into the wounded portion of a large artery would give rise to dangerous bleeding; and hence the general necessity of applying two ligatures, one immediately above, the other below, the opening in such a vessel. A single ligature on the brachial artery, as I had an opportunity of seeing at London in a case of gun-shot wound, where rather than vessel of the continuation of the radial or ulnar gave way, on the loosening of the ligature, and, as there was considerable swelling, edema, and inflammation of the hand, threatening gangrene, the surgeon under whose care the patient was desired it right to perform amputation.

I should be sorry if these observations were to hold out any general expectation of the great and dangerous practice of applying only one ligature above a wound in a large artery, as in any recent case of false arterial aneurysm. The aneurysm delivered above were chiefly intended to refer to gunshot wounds of the leg, great artery of the popliteal artery, and hemorrhage first breaking out several days after the receipt of the wound, when all the parts below the knee are enormously swollen, and in a state of inflammation and suppuration. Here the hope of avoiding any additional violence or injury of the damaged parts below the knee may be a good reason for taking the chance of stopping the bleeding by a ligature applied to the femoral artery; a reason, however, which would not exist in the case of a recent wound of the popliteal artery with a bone. At the same time I believe the chance of checking the current of blood will not always suffice, and that occasionally early the dangerous symptoms of effusion upon the swelling in the damaged state of the leg, and of applying a ligature above and below the aneurysm in the popliteal artery, must be applied to the aneurysm, or suppuration perforated. When the first plan has answered in some cases, and not in others, may depend upon the size and condition of the wound or opening in the artery, and, as examples of clamping upon the degree, at which the risk of the vessel may have been closed by the influence of inflammation. When a conclusion may now have been made respecting the risk of the vessel being wounded or opened, while in fact only a branch of it

to contend with these casualties, as while the possibility of openings has been made by different bullets.

As a soldier writes his acquaintance, "It is an experience thing for a ball, in striking against the sharp edge of a bone, to be split into two portions, each of which takes a different direction. Sometimes it happens that one of the pieces remains in the place which it struck, while the other continues its course through the hole. I've hit with the side of the pistol, I have known one half pass through some member of the body, and the other remains in the joint or mortis, without its previous trace being suspected. In one case, however, I have seen a ball divided by striking against the spine of the scapula, and one portion of it pass directly through the chest, from the point of impact, while the other moved along the interspaces, till it reached the diaphragm. But the most frequent examples of the division of bullets which we had occasion to see, were those which were produced by balls striking against the spine of the scapula or the scapula, sometimes happen, that one portion of the ball strikes the vertebra, while the other either remains behind, or passes over its external surface. Not infrequently, in all cases of the entrance of balls are lodged between its two tables, in some instances both fractured and shivered in these strips, and in other instances without these bones being changed." From these facts it must be evident, that when a gunshot wound has two entrances the surgeon cannot be certain that the bullet has not been divided, and that penetration is deeper, than the entry ball just happens to be found. (See *Thomson's Disc. on Military Hospitals in Belgium*, p. 27, &c.)

As the study of the facts would be combined and comparatively gunshot wounds have at first been generally considered, and most other wounds, unless there is a hemorrhage, happen to be injured. In the beginning, there may even be little hemorrhage, though a considerable injury is so often, and a hemorrhage is a dangerous and often bleeding injury. Thus, (as I have already mentioned), in one of the wounds of the chest, which I received a gunshot wound through the lung, the physical injury was very slight, but after the injury, and compelled me to take the antiseptic injury, and in the Hospital at Brussels, I received the wound under the care of my friend Dr. Giller and myself, about a week after the battle of Waterloo. The case of hemorrhage, on the lowering of the strength, were tolerably common, not at all surprising with a more calculation, that the presence of such elements, require the figure of a man, as very three or four in 1000. (See *Thomson's Disc. on Military Hospitals*, p. 5, &c.) In Belgium, the case of Dr. Hutton's observation upon this point appeared to me to be completely confirmed.

It has long been known, that a bullet may be lost by shot off, even after it has struck the body, and hardly any hemorrhage arise. We had numerous proofs of this, but after the battle of Waterloo. I had made my case a man of the rifle brigade, whose arm was shattered to pieces at least as the shoulder, yet there was no hemorrhage. I sympathized the high of a British soldier whose leg had been completely shot off by a cannon ball, but there was no hemorrhage before the operation. At Mauthausen, in 1814, I saw a case of the great part of the right arm, and many adjacent parts had been carried away by a cannon ball, and yet no bleeding of consequence occurred.

Sometimes, after these violent injuries, the large arteries do not find interruption. "We saw a man (says Dr. Thomson), whose leg had been shot off by a cannon ball, in amputating the leg above the knee, the arteries of the thigh were not perceived to bleed; nor did any of them afterward require to be tied. A considerable loss of blood followed itself, in which the arm had been shot away close to the shoulder joint."

Sometimes the common, produced by a cannon ball, or the passage of a bullet in the vicinity of a large artery, results in some enlargement of the upper part of the vessel, and a subsequent dilatation of its body by the effects of sympathetic lymph. This is proof of this statement are recorded by Dr. Thomson. (See *Thomson's Disc. on Military Hospitals in Belgium*, p. 21, 22.)

Artificial, however, bodies, such as pieces of iron, lead, &c., produce the same dangerous wounds than usual gun bodies, the leaden bullets. Wounds occasioned by a small shot are frequently more perilous than those produced by larger balls; because their

track is so rapid that a bullet is traced, but can scarcely the entrance body most extensive. Such a shot often injures a vessel, which there is not the slightest external evidence of the entrance. Sometimes a great part of the danger also comes from the motion of the bone which has been struck.

REMARKS ON THE TREATMENT OF GUNSHOT WOUNDS.

The first thing in the treatment of a gunshot wound in one of the extremities is, to determine whether it be most advisable to amputate the limb immediately, or to undertake the cure of the wound. When a bone, especially the joint, is very much shattered, when the fleshy parts, particularly the great blood-vessels are severed, are lacerated, when the whole limb has suffered a violent contusion, and is cold and senseless, there is no hope of preserving it. In this case, it is the surgeon's duty to amputate at once, and not to delay till inflammation, fever, and tenderness, to mortification come on. But besides this violent degree of injury, in which the possibility of amputation is obvious, there are several lesser degrees, in which it is often a difficult thing to decide whether the operation is necessary or not. Then the surgeon must look not only to the injury, but to the patient's constitution, and even to external circumstances, such as the possibility of procuring good accommodations, rest, attendance, and pure air. But it is especially to be considered the necessity of amputation by general rules. In every individual case, the surgeon will consider mutually the particular circumstances, before he decides to decide. The grounds against any operation are, the pain which it causes at the period when the whole system is disturbed by a terrible injury; the operation of a limb, and frequent amputation, in which cases, aided by judicious surgery, repairs the most terrible wounds. The following are the reasons in favor of the operation. If the patient gets out of a frightful condition, which threatens an increased pain, and which is increased as it were, for a simple wound case. The pain of amputation is not of more instant than the pain which the wounds last cause, and the extraction of foreign bodies would cause in case the operation were abandoned. In case of gunshot wounds, the loss of the limb cannot be taken into the account; for the surgeon only undertakes the operation when he designs to save the patient's life by that operation, and acknowledges that the part itself cannot be preserved. Even if he should despair, the patient of a limb, that perhaps might have been preserved, there is this statement, that he can furnish last with an artificial one, which often proves to be more serviceable than the one which would have proved, had it been preserved. Should the operation be found to be so indispensably performed above the wound.—(See *Thomson's Disc. on Military Hospitals*, p. 1.)

When amputation is deemed necessary, the surgeon, according to several firmly as regards, is to divide the vessel by one or more incisions. Many of the modern weapons employed by the surgeons, when directed into the body, instead of incisions before they could be entered; and this was the case, not only with regard to the arms, but also with regard to the use of stone, pieces of iron, and leaden bullets, which were thrown by means of slings. Unless surgeons the necessity of cutting to the vessels, through which these bodies had entered, and may therefore be justly regarded as the first and most necessary of the practice of division in the treatment of wounds made by gun bodies.—(See *Thomson's Disc. on Military Hospitals in Belgium*, p. 28.)

Such division has been said to have numerous advantages; to facilitate the extraction of foreign bodies; to produce a typical healing, and afford an opportunity for the amputated limb in the circumference of the wound; to prevent the formation of the track of the ball, by an open wound; and, lastly, to divide ligaments, arteries, and veins, which otherwise might give rise to sympathetic and other untoward symptoms.

More modern experience proves, however (Götte, p. 629), that the utility of such incisions has been overrated; that they generally increase the inflammation, which in these cases is so much to be apprehended; that wounds which are not dilated externally heal more speedily than others which are; and that there are only a few cases in which incisions are beneficial. In fact, as Dr. Hennen has correctly stated, the knee

is now rarely, if ever, employed in the first instance by English surgeons, except for the purpose of ascertaining the nature of the wound, and other extraneous bodies, or for facilitating the application of ligatures to bleeding vessels.—(*See Principles of Military Surgery*, p. 44, ed. 2.)

The apparatuses from the practice of dissection—viz. the *trachea* (Trachea), were very early pointed out by Galienus; and it is singular how much the opinions of this author, with regard to the point in reality surgery, coincide with those of Mr. Hunter.—(*Op.*, vol. p. 46.)

The causes of gun-shot wounds are various. Sometimes the track of the ball goes superficially under the skin, and only has cut opening.—When it goes in and out, and the ball has perforated a bone, and a considerable blood-vessel, all injuries are serious, for the wound here cuts off the arteries. Though dissection the wound has been practised with a view of giving vent to matter, excreta, and foreign bodies, and even its whole track has been laid open when superficial, an experience proves the reality of such things. As when a ball has passed with great force there is often a real line of resistance in the skin, a portion of which is driven forward before the ball, it follows that the opening of a gun-shot wound must be more extensive than that of a punctured vein. By the separation of straggles, the wound becomes still more dilated, so that not only matter, but foreign bodies which approach the skin easily find an exit. Besides, incisions commonly close again very soon, and in a few days the wound falls into the same state as if no alteration at all had been made.—(*Hunter*, p. 303.)

Ligaments, fibres, and vessels are often situated about the orifice of a gun-shot wound, and some surgeons have made it a rule always to divide them completely; but, when the vessel is injured, the tearing and contusion of parts should cause violent spasms and nervous symptoms, and should be regarded the discharge of matter and foreign bodies.—When they discoverly raise the first efforts, the propriety of dividing them cannot be doubted; but with a mere exploration of the orifice I consider the practice unnecessary. Here, as Mr. Hunter wisely remarks, the method would be very good if wounds and fractures were such a source of wounds, as it is now to be proved that the effects of dividing a part that is already wounded were different from those of the first wound; but the employment of the knife being only an extension of the first incision, it is to be considered as common sense, and common observation.—(*On Gun-shot Wounds*, p. 331, 332.)

The extraction of foreign bodies works as one of the most urgent motives for the dilation of the wound, and no doubt it is right to remove as first as may be those as possible. Their removal prevents the wound, causes violent spasms and inflammatory symptoms, and causes suppuration; suppuration which the timely extraction of them may prevent. Yet let it be remembered that the extraction of foreign bodies is frequently attended with excessive irritation, and that, while they lie too freely fixed in place, it is often a matter of impossibility. After the clots have appeared, and the wound has become widened, suppuration frequently does not prevail long before the extraneous substance becomes loose, spontaneously separates, the skin, and easily admits of removal without any difficulty.

Hence, it is generally prudent to attempt at first only small foreign bodies as we near the external opening, gentle, and removable without much inflammation; or such as pass on parts of the surface, and thereby cause dangerous symptoms. The surgeon should avoid interfering with those which are deeply and firmly lodged in the wound. He should avoid suppuration, and the detachment of straggles, and when the foreign bodies become movable and apparent, he should extract them with or without an incision, as various stations may demand. The removal of the wound ought to be made as early as possible with the finger, which increases less, and does not cause distress, and a good. A great variety of instruments have been devised, either for ascertaining the position of balls and other foreign bodies in gun-shot wounds, or for extracting them. But however ingenious and diversified the contrivances may be, they all stand in being divided into three kinds. The first consists in the principle of a pair of forceps, others are shaped more or less

like spoons; and a third description are made in the form of a cork-screw or worm. These last are only designed for cases in which the ball is fixed in the substance of a bone, and is quite immovable. For if a wire is lodged in the soft parts, this position requires for introducing the wire into it would cause an inflammation of the parts in the interior of the wound. Barretraves, constructed in the form of *serpents*, into the groove made at not being adapted for entering the soft tissue, their heads are expanded, which always causes the wound, and causes a great deal of distress. Persons have been destroyed with blades which may be introduced separately, and then joined together with a wire. When a ball lies superficially, the fingers are a sufficient means of extracting it, being introduced, and with respect to indolent wounds, as Dr. Hunter has justly observed, they are completely unnecessary in the common cases, or that of *Barretraves*, though unfortunately the art of instruments is most abused in treating deep wounds where we are told that the use of them.—(*Principles of Military Surgery*, p. 76, ed. 2.)

The extent of the wound does not necessarily indicate its severity. Extensive wounds appearing in the vascular portion probably, as some have been led to be easily recoverable, or they continue to increase, prevent the cure, and give birth to a suppuration. In some instances, the wound closes, and the blood is retained in the skin during the wound remains, and in other cases after a time they bring on a suppuration of the surrounding parts. Sometimes a foreign body remains in the wound, and after a time, and afterwards making its appearance in a different part, where it may excite inflammation and suppuration.

When the ball enters in the wound, it is better to thrust it in, as the parts collapse after its passage, and make an opening in the skin which would not be the ball itself. The ball does not generally enter a straight direction through the wound, but enters a very tortuous one, particularly when the ball is badly shaped. In every case in which it is not clear that vessels of the wound are exposed, it is better to leave the wound as it is, and let the blood flow out, and the first intention to cure.

Remember the ball may be both easily and safely removed. At such times it becomes the surgeon's duty to be quick, and to be sure. According to Mr. Hunter, if the fragments under which the ball is lodged should be so situated that they were getting through, they are to be considered as already split, and no opening is to be made in them for the extraction of the ball. But when the ball lies in a situation where the skin that it can only be for, and the skin over it is quite unbroken, no incision opening ought to be made. The wound heals better when the ball is left in, and for less inflammation takes place in the recovery of the extraneous body than when the orifice of the wound. A counter-opening always renders the inflammation of the bottom of the wound as great as at first. It is better to let the wound heal up, and extract the ball afterwards.—(*See Hunter*, p. 333.)

To the practice of this Mr. Hunter has no objection, who seems to be that he has not seen a great number of balls which were not more than an inch from the surface, and never found any suppuration arise. But when the ball lies three or four inches from the surface, and being so distant, he is then that its removal should be first made with the eye of extracting it.—(*On Gun-shot Wounds*, p. 33, 34, ed. 2.)

Sometimes the ball penetrates the wound just at a bone, and follows freely in it. When a wound is formed superficially, if any substance is introduced and introduced by means of an elevator with a skin and what curved necessary, and when it is found that the ball is deeply lodged, and will not move, it is to be removed. Should the attempt be the appearance of a fungus on the wound of the ball is recommended by some writers; while others, finding the process difficult, and afraid of such an operation, and not feeling that balls have sometimes remained for a long time for many years without any serious consequences, content themselves with the last remedy. Mr. Hunter says it does not as a general rule, subject to a few exceptions, that a ball shall never be allowed to remain in a bone; he says he, "if a ball lodge in the head of a bone, and is not removed, it generally causes death of the bone, disease of the right, amputation, or death." In this case of a long bone, however, the last part

allows, with masses and jets of matter. On a hot bone cavity is equally the result, and if it is surrounded by large vessels, various jets in various directions, contractions of the hot take place, and the gullet drags on for years, wastes of life, and ready to submit to any thing to obtain relief.—(On Gun-shot Wounds, p. 20, ed. 1.) A mass of these cases are given in terms to be considered, however, that the pressure, absorption, and various action the effect of the movement of the ball, that of the vessels, logically accounted for the parts injured which it has struck. All medical forms latter only assist the attempt to remove balls with a slighter when they actually produce dangerous effects.—(Ibid. de Cline, M.D., 4, p. 100.) I am disposed to believe that whatever the situation of the ball is, whether it has been removed or not, from a case with tolerable continuity, and without too much infection, the practice is commendable. This branch of management of gun-shot wounds appears to me still to require further elucidation, for though experience has been abundant, the right effect and quantity of particular are yet laid down in the best possible way.

As soon as the requisite conditions are ready, and danger has been eliminated, the primary object is to treat most of gun-shot wounds are accomplished, and the rest is, in reality, the different view the variety of other wounds.

With regard to putting gun-shot wounds; when it is evident that the shot has passed over, and no particular object can be fulfilled with the probe, it is either better to disfigure with such exactness, as to leave all necessities but none. Introducing any instrument is generally disadvantageous and painful irritation. But when the ball or any other extraneous substance has lodged in the wound, and its situation is not immediately evident, it will often be advisable to search for it in order to see that it may be extracted, if its situation will allow, before inflammation begins. The surgeon, therefore, notwithstanding the common view, cannot turn to leaving it impossible consequence of the nature of the wound, rather give a probe that penetrates to some extent, he thinks more likely to pass readily along it, and avoid then, proceed to make the extraction. But when this is very painful, and the course of the wound obvious, it will often be better to dissect, and remove the search when suppuration has taken place, in which case it can be undertaken with more ease and a greater prospect of success. When gun-shot wounds are ordered, the tenderness and swelling of the parts are particularly strong reasons against painful probes, as efforts to extract foreign bodies as long as this state lasts.—(On Gun-shot Wounds, p. 27, ed. 1, vol. 2.)

There is no doubt in the practice of surgery better concluded that the dressing of narrow scale and gun-shot wounds with lint is particularly harmful. The only possible reason for doing so is the latter cases must be to keep the surface of the wound from healing up, and disfigure extraneous bodies, unless, &c. The application of this happening at first is quite inadvisable; for the inside of the mouth of the injured part is often lined with a slough or scorch, which need necessarily be removed before the parts can heal. The first dressing, therefore, should be with something soft, and of a mild, soothing nature. On the ball of the foot, indeed, it would be well for safety of the wounded, if the stump were to be coated himself with a soft, simple dressing, and covering the part with linen wet with cold water. This method would prove much more healthy than the hairy and cottonaceous use of absorbent clothes, wadding, and such waddings, from the bad effects of which thousands of soldiers have lost limbs or lives, which, under more judicious treatment, might have been saved. Having used to varying, sometimes, plasters of simple liniments, and frequently over the latter an excellent powder. In the suppurative stage of gun-shot wounds poultices are generally allowed to be the best applications.

Proceeding thus, since I cannot altogether approve the following directions, though they are certainly better than any given in many original books. "A small bit of each lint may be placed loosely between the lips of the wound, in order to keep it from closing. It is unnecessary, it should be introduced a little beyond the lips, in order to exclude all fluids off and, and to prevent irregular collection from flowing over the surface during the supplicative stage. As those

would keep the direct exit of the discharge. For the wound is not to be closed with lint, which has been showed with it. A pledge of some simple material being then laid on with care or cloths to secure the discharge, and those prevented from coming off by a bandage loosely applied, the patient may be put to bed, and so placed, if possible, as to keep the centre of the wound dependent."—(Quercus, p. 185, 186.) The reason for what I consider objectionable, namely, introducing lint in first dressing the wound, was no doubt to avoid cohering.

In considering the effects of position and cold application upon gun-shot wounds, Mr. Graham remarks a learned and judicious in the use of cold water.—"The inflammation is, in some instances, exceedingly prevented in many greatly controlled, and in almost all, very much subdued by it, with the suppurative process is not stopped, in the quantity of cases, or in degree sufficient to interrupt the subsequent act of granulation. In all simple cases of gunshot wounds, that is to say, such wounds, in persons of a healthy constitution, a piece of lint which has been dipped in oil, or to which some balsam has been spread, is the best application at first to prevent cohering, with the view of adhesive plaques placed across to make it in its situation. A poultice, or some kind of dress wetted with cold water, or when to be applied over it, and kept constantly wet with oil, even by the use of oil, if it can be obtained, and be found comfortable to the feelings of the patient. A roller is of service, to keep it from the compression from changing the dressing along, and is, therefore, at that period most useful as a surgical application it is useless, if not positively injurious, because it hinders a part which ought to be a certain extent to swell, and by pressure causes irritation. However gentle it is to be applied immediately after some days have elapsed, and it is impossible to keep it there in the face of heat, even if they were useful, some warm poultice is to be kept in position; because, when they are applied in the first instance, they soon become stiff and bulky, and are the most painful, and are seldom present after the first dressing was to be made useful in the period when the surgical application of a water was indispensable." To this last reason of the wrong employment of rollers, Mr. Graham annexes some remarks, in which he enters into a general consideration of position, its application to gun-shot wounds, believing that, in many instances, cold water only be employed with the best effect during the whole progress of the cure. These remarks are tempered with the following observation:—"Cold water is not, however, an infallible or even always an advantageous remedy; there are many persons with whom cold applications do not agree; there are cases with whom they destroy after a certain period; and, in other cases, they should not be persisted in. Cold does no good in any stage of inflammation, when the secretion arising from the first application of it is not agreeable to the feelings of the patient; when, as then, it does no good; but if it produces a sensation of stinging, or an uncomfortable feeling of any kind, with stiffness of the part, it is doing harm, and a change to the most soothing of waters will not only prove more agreeable but more advantageous. This holds in general about the period when suppuration has taken place; and yet, in such cases, is preventing the full effect of the action which warmth encourages. Precautions are then proper; and if a position be preferred for the application by day or by night, an unobtrusive use of heat will be found sufficient. In the spring of the year, the warmth of the sun makes an excellent poultice, and so do turpentine, cataplasms, &c., judiciously of course, liniment, sweet, hyacinth, and other firmnesses and balsams. In all those cases where a position is avoided by its warmth is to be paid to the period of suffering as of applying it. It is used as a moderate poultice, softness, swelling, the numerous arising from cold, and is changing the remaining of interrupted action of the vessels towards the presence of matter; and as such as that that applied has been stated, the position should be changed, and become again had to cold water with compress and bandage."—(P. 18-27, ed. 2.) Although I fully coincide with Mr. Graham, respecting the general advantages of cold water, the dangers of tight bandages, and the bad effects of constraining positions too long, I do not coincide in

many of the symptoms which he has expressed about these last treatable suppurations. On the contrary, I appreciate that in the best means, whenever a thought is to be thrown off the matter is decidedly fitting, and in these efforts are very frequent in cases of gunshot wounds, my own opinion of the utility of cold applications is limited to the first three or four days after the receipt of the injury. Nor ought cold applications ever to be continued where the temperature is low, and languid circulation in the part induces a risk of gangrene. Hence, when a principal artery is lacerated, its employment is always wrong and hazardous. At the same time I have no hesitation in declaring my firm belief, that fifty times more gunshot has been done by tight rollers applied to recent gunshot wounds, than by either position or cold applications.

Further, when the track of the ball has two apertures, a scar is sometimes drawn through it, with the view of preventing a secondary discharge of the wound, and introducing proper applications. The scar is also supposed to give free vent to pus, and to promote the evacuation of foreign bodies. But a gunshot wound is better left open to close granularly, and while a scar rather obstructs the exit of pus, it may as easily push foreign bodies more deeply into the track, as out of it. There are preferable modes of applying the necessary remedies, and as a rule in an extensive substance itself, its employment cannot fail to be highly pernicious.

Gun-shot wounds generally require the employment of antiseptic means, just as other wounds attended with equal inflammation. When they are in the undrained state, the application of leeches is highly proper. In these cases bleeding is recommended, and in such a measure as if it were of more service in these than wounds in general. But the necessity for the operation is really not greater than in other wounds, which have done the same degree of mischief, and from which the same quantity of inflammation and other symptoms are expected. Bleeding is certainly proper here, just as it is in all controllable wounds attended with a severe, fat fatal, and great chance of extensive inflammation, and much symptomatic fever. In every instance, however, the practitioner must take some care not to be too long in the practice of bleeding; for when the patient is reduced below a certain degree, his strength is inadequate to support the large and long-continued suppurations which often cannot be avoided.—(See *Illustr.*, p. 362, 363.)

As the orifices of the vessels torn by the ball are compressed, and as a new, oftentimes, sometimes to be changed of importance is remarked in it. But as I have already stated, after some days, and frequently at a very late period, when the slough separates, violent hemorrhages may occur, which are the more dangerous as they come on unexpectedly, and often when the suppuration has already induced great debility. The surgeon himself may increase the bleeding by removing the dressings carelessly. Hence, in every case where, from the situation of the wound, there is reason to apprehend injury of some considerable vessel, the patient must be constantly and strictly watched, and every thing necessary for the immediate stopping of hemorrhage provided.

Another kind of hemorrhage, still more dangerous than the former, particularly occurs in such gun-shot wounds as have long been in a state of violent suppuration. The blood does not issue from one individual vessel, but from the whole surface of the wound, as from a sponge, and in such a manner to prevent blood and water. This hemorrhage is very dangerous, because it is particularly apt to exhaust the patient, who is already debilitated, and its causes are difficult to remove. The case demands the exhibition of bark and diluted sulphuric acid; the dressing is laid with a preparation of starch and being applied to the wound.—(See *Illustr.*)

Gun-shot wounds in trochanter military hospitals, especially when they are established in military hospitals, and the dressing is not paid to ventilation, cleanliness, and cleanliness with some cold gas, are often attended with local gangrene, a very serious and dangerous complication, of which I shall speak under the head of Hospital Gangrene.

The pain of removing the first dressings is so soon as necessary in gunshot wounds at other cases, by

creating a primitive inflammation of the parts. This observation is particularly true when dry has been used, and it is so when in the wound. When the occurrence of bleeding, severe pain, or other extensive symptoms occur, on either a different time of contact, I think such dressings should rarely be removed before the end of the fourth day. And a cold-water has not been constantly applied over the wound, so as to keep it moist, or if such has not been spread with some mild saline or digest it in it, I think it a good plan to apply an emollient poultice over it the evening preceding the morning on which the dressing is to be first changed. By this means they will be softened, and relief of being taken away without pain or irritation. With the same view, plenty of warm water should be applied from a syringe, and allowed to fall upon the dressings. Physicians at all of whom should generally be taken off under this, yet not, so they are not adherent, and in warm weather, may become moist and relaxing.

For after days the matter seldom assumes a healthy appearance; but as soon as the wounds require, a first process of a proper quality, and the wound was to be closed as a simple abscess.

Sometimes the healing process does not succeed, though suppuration has preceded a considerable time. On the contrary, notwithstanding the existence of a virus and a generous diet, the suppuration ceases to proceed thoroughly, and the wound becomes chronic, left the matter there. The bones show an disposition to move, and the patient, ordered by local dressings, is really approaching suppuration. In this case, the any suppuration is preserved by antiseptic dressings, but without result. We ought never to be deterred from undertaking the operation in the later and unclean, which frequently even disappear when the best means is resorted.

OF APERTURES IN CASES OF GUNSHOT WOUNDS.

The 21st volume of this Dictionary, published in 1814, contained all the valuable observations of Baron Larrey, of former of military surgeons, in every instance in which the operation is considered judicious. Since then, the policy has been formed with several good practical books, in which the necessity and necessity of early or immediate amputation in such cases are largely treated, and the work of the doctrine is illustrated by additional facts. It is to be observed, however, that the early too hasty plan (as there have always been some advocates in the military practice. "The Doctor says Dr. J. Thomson) is the last written on military surgery, in which works I have found the professional attention in the severe cases of the extremities; and it is worthy of remark, that he directs the operation to be performed before inflammation and other constitutional symptoms shall have supervened.—See *Traité de la Cure radicale et permanente des Amputations*, par J. de la Croix, Paris, 1812, p. 313; and Thomson's *Report*, &c. p. 181. Whether not only recommended and practiced immediately amputation, but the same thing, was not unfortunately done by the military surgeons of his time.—(See *Report*, Thomson, by R. Thomson, 3d ed. Lond. 1826, p. 413.) The celebrated Dr. Price, in the excellent little treatise of military surgery, declared himself an advocate for immediate amputation in all cases in which that operation, when first, appears to be indispensable. Le Dr. Price has in the same time stated briefly, but most judiciously, the circumstances of all cases of this practice, with those which may be expected by delay.—See *Traité de la Cure radicale et permanente des Amputations*, par J. de la Croix, Paris, 1812. Early, who has argued against the late of Le Dr. Price, with regard to the utility of immediate amputation. In order to give some idea of the necessity of amputation, early proposed that the surgeons, during battle, should be allowed to remove limbs, and amputated in the rear of the army.—See *The Method of Treating Gunshot Wounds*, by J. Early, vol. 2, p. 25, London, 1814.

After the battle of Waterloo, in the year 1815, the Royal Academy of Surgery in France adopted a vote for the best dissensions in the gunshot injuries requiring immediate amputation, and in other cases of the same nature, where the symptoms, though deemed la-

erately, might be delayed. "L'expectation d'une opération chirurgicale dans les plaies compliquées de fractures des os, et principalement celles qui sont fracturées par armes à feu, détermine-t-elle ou non le fait d'une amputation, ou le danger, et le danger si imminent de la laisser, et en l'absence des causes?" The first was adjudged to be the question of M. Pature, the main object of whose paper was to demonstrate delaying the operation. The sole of the question proposed by M. Pature has found some modern advocates of degenerated talents and valour, such as it is between the camps of Russia, France, Prussia, and Lombardy. It is, however, only justice to M. Pature to state in this place, that though he required immediate amputation as that of danger, he admitted that there were some kinds of injuries of the extremities in which it was inadvisable and immediately required. "The circumstances," says Dr. Thomson, "which may rather be given of these injuries to leave still and distinct than any which had been published before his time. And, what may appear strange, it does not differ, in any essential respect, from the amputation given by later writers, who, in combating his opinions, have appended him as an enemy to amputation in almost all injuries of the extremities."—(*See Report of the International Conference of the Military Hospitals at Berlin*, p. 152.)

By 1740, Baron Percy, who was a few years ago at the head of the medical department of the French army, published a book, in which he gave a preference to delaying amputation as first, even in cases where it is certain that the operation, once performed, will be demanded.—"See *Mémoire de Chirurgie et de Médecine*."—Even as late as 1806, Landolt, professor in the Military Academy of Strasbourg, defended the doctrine of M. Pature.—"See *Chirurgie des Blessures des Membres supérieurs* par J. Landolt."

Although in France the Academy of Surgery thought proper to determine prior to M. Pature, whose doctrine thus received the highest approbation, yet in that country very opposite limits were set to its more quiet and contingent nature, and extensive military practice. Thus, Le Doyen, consulting surgeon to the French army, in his work on gun-shot wounds, published in 1720, expressly states, "that when the amputation of a limb is indispensably necessary in the case of a gun-shot wound, a ought to be done without delay."—(*L'opérateur*, v. 1.) Dr. La Marquière is particularly wise in his excellent observations in reply to Blandin's arguments which, I think, would do honour to the most accomplished surgeon of the age in which we live.—"See *Mémoire sur l'Expectation dans les Plaies de Brûlures, et dans les Plaies de Chirurgie*," t. II, p. 1, 104, in (1786.) M. Boucher, of Lisle, was an advocate for the same side of the question.—"See *Observations sur les Plaies de Brûlures et de Médecine*," t. I, p. 1, 104, in (1786.) Blandin, who was many years surgeon-general to the Prussian army, published in 1770 an essay on amputation, in which he is particularly rigorous, that during his stay at Paris, in 1738, the surgeons of the Hôtel Dieu had been in the habit of performing extensive amputation in severe injuries of the extremities. He also declares himself as adequate for operations immediately in all cases, in which amputation from the first appears to be necessary, and insists, in a particular manner, on the increased danger which he had seen arise from the disease during the second period. He gives this life, J. Thomson has inserted a minute and circumstantial description of these injuries, both of the upper and lower extremities, in which he considered amputation to be necessary, and in many of which he had actually performed it with great success. Blandin's opinion is Dr. Thomson to have given a better account than any preceding military support of the efficacy of the ligature; and even the results of his experience, he was led to believe, that though compound fractures of the lower part of the thighbone might, in favourable circumstances, be cured without amputation, yet that this operation is particularly necessary in all cases in which the fracture is situated on, or above, the middle of that bone.—(*J. L. Thomson, Traité de Chirurgie Militaire*, & J. Blandin, 1780.) With the foregoing arguments we have to join one of not less authority, namely, that of Baron Larrey, who has proved this so convincingly, that when amputation is to be done in cases of gun-shot wounds, nothing is so pernicious as delay.—(*See Mémoire de Chirurgie Militaire*, tom. 2, p. 454-455.)

It is further to be remembered, that the principles

declared by Baron Larrey are, in point of fact, the same as those which were so strenuously advocated by Mr. Pott, whose principal remarks on the necessity of amputation in certain cases are contained in another part of this publication.—(*See Amputation*.) Mr. Pott, indeed, was not an army-surgeon, and what he says may not perfectly be designed to apply to military practice; but he has, represented, as well as any body can do, the necessity of immediate amputation in cases in which there are doubts that amputation cannot be dispensed with.

Mr. John Bell, among the moderns, appears to hold Thomson to have been right by the above manner as which he defended the necessity of early amputation, long before the contents of later writers were ever thought of. He distinctly says, that amputation should, in those cases where the injury is clearly and irreversibly done, be performed upon the spot.—(*See Thomson on the Fracture of the Femur*, &c., of Wounded, p. 69, 182, 23.) In short, notwithstanding all the military professions in vogue upon this interesting topic, we must acknowledge, with Dr. Thomson, that the primary in favour of the advantages of immediate amputation, and of early amputation was that of the army.—(*See Report of the Conference of the Military Hospitals at Berlin*, p. 152.)

The strongest body of evidence upon this point is undoubtedly afforded by Baron Larrey, whose situation at the head of the medical department of the French army afforded him most favourable opportunities of judging from actual experience. "Upon this subject," says he, "more than thirty years of continual war have afforded me an opportunity to the highest pitch of perfection, there can be no mistake." It is after having repeatedly compared the medical systems at this time, it is worthy of remark, and beyond all question of the army, that I proceed to discuss the different opinions delivered in the hospitals, and to settle definitely this great question, which I regard as the most important in military surgery.

If we are to decide that the amputation of a limb is a great operation, dangerous to the consequence, and always prevent of the patient who is thereby disabled; that, consequently, there is more danger in doing a limb, than in cutting it off with despatch and ease; these arguments may be refuted by answering, that amputation is an operation of necessity, which admits a change of preservation to the extremity, whose death appears certain under any other treatment; and that if any doubt should exist of amputation being essentially indispensable to the patient's safety, the operation is to be deferred, all nature has declared herself, and given a positive judgment for it. We are also justified in adding, that this plan of preservation is at the present day much greater than at the epoch of the Academies of Surgery. We learn from M. Pature, that of about three hundred amputations, performed after the battle of Fontenoy, only thirty were followed by success, while, on the contrary (says Baron Larrey), we have since seen more than three-fourths of the patients on whom amputation has been done, and some of whom were but two limbs removed. This improvement is ascribed by Larrey, 1. To our now knowing better how to take advantage of the advantages and disadvantages, time, for amputation. 2. To the better method of dressing. 3. To the mode of operating being more simple, less painful, and more expeditious than that formerly in vogue.

To the preceding authorities against delay in amputation, in cases of gun-shot wounds, requiring amputation, I have to add Mr. Goussier, Deputy Director of military hospitals, whose opportunities of observation, during the time, was at Lyons, were particularly extensive. In his work he has detailed the opinions of many military surgeons and French surgeons, respecting the propriety or impropriety of the doctrine of immediate amputation, and he has introduced some great criticisms, particularly on Blandin's statement of the success which was experienced in the Prussian hospitals from not performing the operation. Mr. Goussier, however, does not recommend amputation to be more immediately, if the patient be particularly depressed by the shock of the injury, directly after the removal of a piece of shrapnel, which, I believe, has already been in all times followed, not only in respect to amputations in cases of gun-shot wounds, but in other severe local injuries. "I believe it to be," says Mr. Goussier, "a stretch of theory in those surgeons who consider that if the limb injured the day in all cases, the patient would have the best

disorder of memory. No one will deny that if the dog performed a regular navigation, it would not be better than to have it do so automatically; but if they were to say the operation should in general be performed automatically after the injury, I can only oppose it because facts do not stand, and the essential point of my objection, namely its desirability in view of allowing the first moments of agitation in good sense, before any thing be done, is a point entirely foreign from that to use, etc., or right here, according to the difference of conviction and the different opinions that have been stated. The *opus*, and its three books will at most pass by brief criticism. In the first volume (Paris, 1828, and 2, 1831, 1833). In the first subject of this gentleman's book, the author's want of precision, rather than of exactness, is very apparent in the terms of this which should equally be allowed to transpire between the faculty of the injury and the performance of navigation; but still all the information is convincing that this point, though there is little to fight about, is more rather a question of method than a difference of opinion. All will know the advantages of doing the operation immediately, when by interest it not only and expressed by the shock of the accident; all kind too, prudently or otherwise, the use of little knife is more reasonable; the consequence has involved sufficiently to be capable a genuine use of the book. (See A. V. Hestrich, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2

As to the emergency case, when the proximity of attention is indicated, all delay is improper, beyond the short period during which the darkness necessarily strikes down the heavy eyelids. In the last-mentioned case, the most successful computers were those who in the field hospitals devoted after the arrival of the patients, or earlier, as Mr. Huxton has suggested it, with no little duty as possible. "While hundreds are waiting for the diagnosis of the surgeon, he will never be in a loss to select individuals who will suffer not at all, or but insignificantly, and after their aid, he will betray a reasonable want of science, indeed, if, in this period of suffering, he will minutely investigate the weak, the torpid, the suffering, and the determined. While he is trying his art on a few of the latter class, unaccompanied and a cardinal will soon make a change in the state of the weak or the torpid, and a longer period and more acute pain will render even the staking proper subjects for operation." (*Military Surgery*, p. 35, ed. 2.) It appears from some remarks collected by Mr. Graham, that in the Peninsula, the respiratory inn. in secondary or delayed operations, and in primary or immediate operations, was as follows:—

	Secondary	Primary
Upper extremities	11	1
Lower extremities	3	1

mother, a father, and the third, a boy. They were recovered in the hospital for the newborn in that room, which was supervised by M. Ing. Several days were suffered by virgin Anne, anesthesia was performed: not one of the infants earned.

At Monte, after the re-establishment of Frankfurt, several of the women, who had had their eyes cut, did not have to remain in the hospital. They were then forwarded, with the aid of their husbands,

As soon after the taking of the urine, two attempts, three days apart, at the hospital, 200 g. one of the foreign, the order of the trial, none or less days after the course of the infection. Both the patients died.

At Pompano, Barra-Larrey killed two seagulls, on which management had been known to feed feral dogs along the rim of the garbage dump in the center of the city of July, 1978. She had had a local dog, and the other his right leg. Nevertheless Barra-Larrey's intent, in killing her two dogs, was to rid of witness to the crime of murder.

In the month of August, 1885, two examinations of the patient, in discharging the anæsthetic, had been a kind of hot water, and all the Spout part of their body's hurt. Times were the first time in which it was in charge the gas. At the moment when they had just returned from the anæsthetic on the anæsthetic, a spirit that had been left anæsthetic, from the anæsthetic to keep the body hot, closed, set the body to powder, the material was entirely repelled by the anæsthetic, together with every thing that was wanted in front of the change. The first half of one of the anæsthetics was completely left off, between the two anæsthetics of the anæsthetic, and there was then two anæsthetics. The anæsthetic even gave the man down the back of the space of the third of the anæsthetic. The left hand of the anæsthetic was down away, together with the anæsthetic, and the anæsthetic, and also fired to a considerable degree. The anæsthetic and anæsthetic anæsthetic, and the anæsthetic anæsthetic would have occurred, if anæsthetic had not been anæsthetic performed. In one case anæsthetic was done at the wrist; and in the other at the lower third of the arm. The two anæsthetics were followed by complete recovery, although the anæsthetic was the first and close, in both the anæsthetic, first anæsthetic and anæsthetic.

Second case. When a lady, afflicted by gas-suffering, sinks a bath in with a mirror as to watch M. Sorel, violently motioned, gasped, and deeply stirred away the salt, gasping, impetuous death to be immediately performed. If this manner be neglected, all the offered parts will mean to come with gasps, and besides, as Larrey has explained, the accidents which the gravity of the first case produces will also here be excited. It is only doing justice to the memory of M. Ferno to state, that this second case was one which he also particularly considered as *depressing* the immediate performance of respiration. (See *Paris et Fernal. Rejoux* at Chirurgical, 2. 8. 224, vol. 12, 1250.)

Third one. If a similar body were to carry away a great mass of the soft parts, and the principal vessels were left of the right, for instance, without touching the bone, the patient would be in a state demanding immediate amputation; for, independently of the softness which would originate from a considerable loss of substance, the lost part is inevitably necrotic. Mr. Durell also says, "A transfusion destroying the artery and vein at the neck of the thigh, without injuring the bone, requires amputation."—(P. 283.) When, however, the femoral artery is vein is injured by accident, but, external constriction, the position is advantageous to the vessel above and below the group, is it, if the nature of the cause arises by hemorrhage. But for lesions, that which bone vein and artery are injured, amputation is necessary.—(P. 284.) With respect to bleeding from the femoral vein, as it may easily be stopped by moderate pressure, the necessity of taking any figure at all is questionable.

"An 1834-35 of the Federal artery (abductor Mr. Garrison) regarding an epidemic, administered with fracture of the bone of the lower jaw, in a proper case for immediate attention; Mr. Garrison's early patients would recover from their various ailments, even wounds, I believe, sustained the same way; and the higher the altitude is in the South, the more extensive is the mortality by Amputation."—(Garrison, On Gunshot Wounds, p. 187.)

Flower pale & green, but often the whole part of

a member, breakfasting here, she dies and tears the muscles, and destroys the large nerves without, however, touching the main artery. According to Larry, this is a fairly rare occurring immediate aneurism.

Mr. Galtie seems to coincide in this point with Latham. "If a cannon-shot strikes the neck part of a thigh, and carry away the muscular part behind, and within the great waste nerve, paraplegia is necessary, even if the bone be unstruck, &c. In this case, I would not perform the operation by the circular incision, but would pass a flap from the fore part upwards, as I could get it, to cover the bone, which should be sutured."—(Galtie, On Fractures, Wounds of the Extremities, p. 185.)

PUPP CASE. If a pupp cannot shoot or row fast has been referred, should think a consider unfairly, without producing a suitable pup certainly in the skin, an often happens, the pupp which best in action, such as the bones, muscles, sinews, membranes, and vessels may be ruptured and injured. The extent of the internal disorder is to be examined, and if the bones fractured, through the soft parts, as if they were sinews, and if there should be much in respect, both the swelling, and a sort of fluctuation, that the vessels are loosened, suppurative fluids to be immediately granted. We were soon sorry, that this is also the advice of John Perry. Sometimes, however, the vessels and bones escape injury, and the patient can support the only punishment. In the circumstances we are engaged in follow the counsel of Sir J. Martin, who recommended making an incision through the skin. By this means, a quantity of thick blackish blood will be discharged, and the practitioner must observe. According to Larrey, such an incision is equally necessary in the preceding case before amputation, in order to ascertain the extent of the mischief which the parts have sustained.

It is no such injury done to (individual) persons, that we transmute the *solidity* of many individuals, which would be a large whole attributed to the connection produced in the air. — (See Reason, Twelve *des* Phases of *Arrest* & *Flow*.)

Although, says Langer, this question has been mentioned by writers of high repute, we may easily perceive the intricacies of the inquiry, if we carefully consider, first, the direction and course of solid and liquid bodies, and their relation to the air through which they have to pass. *Sift*, the internal disorder observable in the head bodies of persons whose breath is expelled to the most advantage of their art, regulated by the *Sift*; the properties of the elastic substances, such as the integuments, cellular substance, &c., struck by the shot.

has universally agreed among philosophers, that a solid body, moving in a fluid, only acts upon a column of this fluid, the mass of which column is exactly equal to the surface which the solid body presents.—(See *Le Penseur*, sur quelques Particularités concernées les Fluides, faites par Armand de Feu, in *Mém. de l'Acad. de Sciences*, A. 11, p. 29, de 1763.)

Thus, a chrome-ball, in striking a sphere equal to its diameter, can only displace a portion of air, in the motion of three to two, compared with the size of the shot. This fact is conspicuous in its driftable and immiscibility with the ambient air, is dispersed in all directions, and concentrated with the ball mass of the hemisphere. The force of this perfect resistance amount is nothing, and not a goal can be determined that if there is the slightest velocity of movement on any part of the body, it must disperse upon the direct action of the ball mass.

Besides, if the conditions of the motion of a ball be considered, which taskmaster is known, it is shown, in an instance referable to the spanner of the instance, it will be seen that the spanner is the object against which the ball has passed before striking the object against which it was directed, will already have materially lessened the velocity of the projectile, while the motion of the object of interest be totally lost.

The different agreements which the ball describes in its course, and the structure of the skin, enable us to explain how trifling injuries are produced, without any serious rupture of continuity, and often even without consciousness. The surface communicated to the ball by the pelvis which projects it is, for a given space, reticulated. If at this distance, it strikes against the body, it makes the pain only to be more pronounced, by the sides with which it touches the skin. As the ball, after having traversed a certain distance, undergoes

in consequence of the resistance of the air, and the attraction of gravity, a change of position, and now falls on its own axis in the diagonal direction.

If the shot should strike any resistant part of the body, towards the end of its course, it will now reveal a great portion of the circumference of the part, by the effect of its curvilinear movement. It is also in this manner, observes Lamey, that the wound of a carriage wheelman passing obliquely over the thigh at hip of an individual stretched upon the ground. In this case, the wound is the same as those of which we have been speaking. The most elastic parts yield to the impact of the revolving body; while such as offer resistance, as, for instance, the bones, tendons, muscles, and aponeuroses, are fractured, ruptured, and lacerated. For the same reason, it sometimes happens that the wound is hardly injured.

At first sight, all the parts appear to be entire; but a careful examination will not let us restrain long in doubt about the internal mischief. As this wound is oblique, it must necessarily reach outwardly, because the extrusion of blood laterally takes place in the deep incisions occasioned by the rupture of the muscles and other parts, and because this fluid cannot easily find its way through the texture of the skin. Such circumstances can only be detailed by the terms.

The foregoing reasoning is supported by experience. How often, says Lamey, we see, even the ball carry away pieces of bones, such as the scapula, clavicle, or other part of the soldier's armor, without doing any other injury? The same ball, perhaps, takes off his arm, when at a time when it is closely applied to the body of his comrade, and yet the latter does not receive the slightest harm. The effect may vary between the thighs, and these members hardly exhibit any resistance at the points which are easily penetrated; the only example in which resistance occurs. In such instances, the ball wears the front of the trunk, and the fracture of the ribs is if necessary not at all injured.

Bacon Lamey then relates the following case, which is analogous to one which I saw near Antwerp, and have already mentioned in the foregoing chapter. M. Meger, a captain, standing at the front of a square of foot, in the town of the battle of Arroy, 20th March, 1793, had his right leg almost entirely carried away by a large cannon-shot, without the posterior part of his femur being so close as to possess its position, pointing the lower injury. The violent general concussion ensued, and the extreme severity of the wound, made this otherwise condition remarkably peculiar. The progress of the symptoms, however, was checked by amputation, which was instantly performed. M. Meger was then conveyed to the hospital at Louisa, fifteen leagues from the field of battle, where he got quite well.

Lamey declines relating numerous other analogous anecdotes, which he has been called upon to mention under the same circumstances. M. Baily, a captain of the artillery of the army of the Rhine, was struck by a cannon-ball, his left arm being injured, and his head severely grazed; the corner of his hat, which was placed forward over his face, was shot away as far as the crown. This officer, the side of whose nose was then torn off, was not deprived of his senses, and he was actually courageous enough to continue for some minutes commanding his company. At length he was conveyed to Lamey's ambulatory, where amputated his arm. It is almost enough the patient was well.

Lamey expresses his belief, that what nature does essentially bettered most circumstances, if attended with the smallest share of quickness, vigilance, and attention. The least delay makes the patient's situation more extremely dreadful. The internal injury of the member may be increased by the shock, by the loss of blood, by the little sensibility retained by the parts which have been struck; and, finally, by producing an accident, as already recommended.

In order to illustrate the symptoms, which he endeavored to establish in opposition to many writers, Lamey illustrates himself with the following expression.

At the siege of Bressan, two cannon-balls, having nearly equal weight, were brought down the trenches to the ambulatory, which Baron Lamey had posted at the edge of Palen. They had been struck by a large shot, which, towards the termination of its course, had grazed posteriorly both shoulders. In one, Lamey per-

ceived a slight *échymose* over all the back part of the trunk without any apparent rupture of continuity. Respiration hardly went on, and the patient lay a large quantity of frothy venous blood. The pulse was small and intermitting, and the extremities were cold. He died an hour after the accident, as Lamey had prognosticated. This gentleman opened the body in the presence of M. Dubou, inspector of the military hospitals of the army of the eastern Pyrenees. The skin was entire; the arteries, aponeuroses, nerves, and vessels of the shoulders were ruptured and lacerated, the wounds looked in places, the aponeuroses of the corresponding dorsal muscles, and the posterior symmetry of the adjacent ribs, fractured. The spinal marrow had suffered injury; the neighbouring part of the lungs was lacerated, and a considerable extravasation had taken place in each cavity of the chest.

The second instance died of similar symptoms six-quarters of an hour after his arrival in the hospital. On opening the body, the same sort of wound was discovered, as in the preceding instance.

In the German campaign of the French army, Lamey met with several similar cases, and another examination has invariably convinced him of the actual nature of a spherical body, propelled by means of gunpowder.

North case. According to Baron Lamey, when the metallic body has struck before, especially that which has the point of the foot or knee, and the aponeuroses which strengthen these articulations are broken and lacerated by the fire of a ball, or a fragment of other kind of ball, resistance is insupportable. The same resistance would occur, even the ball lodged in the thickness of the external part of a bone, or were it so engaged in the joint as to be about of being extruded by the muscle and osseous matter. (See also *Gallie on Gun-shot Wounds*, p. 137.)

Disasters extending into the pelvis, and accompanied with great laceration of the ligaments, were some of the greatest injuries pointed out by M. Pature as indispensably requiring immediate amputation. (See *Pature on Cancer de l'Uter*, p. 8.) Thus we see the difficulty was not so remote to early amputation as several the late writers have represented.

It is only in this manner that the patient can be rescued from the dreadful pain, the agonizing symptoms, the violent convulsions, the acute fever, the considerable tenderness, and the general inflammation of the limb, which, Lamey observes, are the necessary consequences of late fracture of the large joints. For, adds this author, if the voice of experience is not listened to, and amputation be delayed, the parts become disorganized, and the patient's life is put into imminent peril.

It is evident, says he, that in this case if we would prevent the patient from dying of the subsequent symptoms, amputation should be performed before death, or at most twenty-four hours have elapsed, even M. Pature himself presented this opinion in regard to certain descriptions of injury. (See *de Clin. Medica*, t. 2.)

With respect to wounds of the knee, the statement of Mr. Guthrie nearly coincides with those of Lamey. "I must sincerely grieve," says Mr. G., "I do not remember a case so well, in which I knew the articulation and the femoral vein to be fractured by a ball that passed through the joint, although I have read great numbers, even to the last battle of Tewkesbury. I show that persons wounded in this way live, if only, or a recovery cannot be aided, where the limb is motionless, torn backwards, and a constant source of suffering, to obtain even this partial severity (the impending death), but if one case of recovery should take place in 100, or in any case of resistance to the nature of the wound (the case). Or is the possibility of a limb of this kind an equivalent for the loss of one more?" (See *Guthrie on Gun-shot Wounds*, p. 136.)

In the attack on the village of Morsman, near Antwerp, early in 1834, a soldier of the 5th regiment was brought to our field hospital, having received a musket-ball through the knee-joint. The staff-surgeon on duty, and Mr. Curtis, surgeon of the 1st guards, were preparing to amputate the limb, when a woman attached to the 50th, slightly recommended differing

the operation. Superficial dressings were applied, and the patient went to the tent. He lived several months after the accident, at times exhibiting hopes of a perfect recovery; but in the end, he fell a victim to his injuries.

Indeed, such is the general unfavorable result of these cases, that Dr. Keegan says it does as a law of military surgery, that no wounded man, particularly the knee, ankle, or elbow, should ever leave the field except under where the patient is not seriously injured. — (On Military Surgery, p. 41, of V.)

According to Mr. Guthrie, because of the patient, without injury of the other bones, afraid of delay, provided the bone is not much splintered.

Sixth case. Larrey observes, that if a large laceration, a small comminuted, or a piece of a bone—being, in passing through the substance of a tendon, should have extensively detached the bone without breaking it, amputation is equally indicated, although the soft parts may not appear to have particularly suffered. Indeed, the violent concussion produced by the accident has shaken and disorganized all the parts; the necessary substance is injured, the vessels are lacerated, the nerves (especially) stretched, and motion left a state of stasis; the tendons are injured of their use, and the circulation and sensibility in the limb are destroyed. Before Mr. J. de la Harpe, Baron Larrey remarks upon cases of this kind of disorder. The case can be supposed to happen only in the leg, where the bone is very superficial, and merely covered by its cutaneous part with the skin.

The following are described as the symptoms: the limb is swollen; the foot and wrist, the knee partly exposed, and, or circal examination, it will be found that the integuments, and even the phlegmons, are extensively detached from it. The circulation extends to a considerable distance; the functions of the body are disturbed; and all the motions experience a more or less palpable disturbance. The intellectual faculties are suspended, and the circulation is stopped. The pulse is small and uncountable; the sensibility gone; and the eyes have a dead, vacant appearance. The patient feels such agony, that he cannot long remain in one posture, and declares that his leg may be quickly taken off, as if it incommoded him severely, and sometimes very acute pain in the knee. When all these characteristic symptoms are observed, says Larrey, we should not hesitate to amputate immediately. For otherwise the leg will be attacked with splinters, and the patient certainly perish.

Larrey adduces several interesting cases in support of the preceding observations.

Eighth case. When a large perforated amputation, such as the elbow, or especially the knee, has been extensively opened either during treatment, and blood is extravasated in the joint, Larrey deems immediate amputation necessary. In these cases, the synovial membrane, the ligaments, and synovial capsule, the part vessels, and cartilages rapidly take place; and scale pores, abscesses, discharges, caries, fibrils, symptoms, and death, are the speedy consequences. Larrey has seen numerous instances of such injuries, on account of the operation having been performed through a hope of saving the limb. In the *Memoirs de Chirurgie Militaire*, Ann. 2, some of these are described.

Although a wound may penetrate a joint, yet if it be small, and unattended with extravasation of blood, Mr. Larrey informs us, it will possibly heal, provided too much compression be not employed. This gentleman adheres to the common doctrine of the pernicious effect of the air on the cavity of the body; yet in this place a small wound is alluded to speaking of the free discharge of small vessels of joints, he says, "a joint that is diseased, requires that positive does participate with the common laws of nature?"

When two limbs have been at the same time so injured as to require amputation, we should not be afraid of amputating them both immediately, without any interval. We have seen Larrey, several times performed this double amputation with success as much as upon the amputation of a single member. He has recorded an excellent case in confirmation of this statement. — (*Ann. de Chir. Militaire*, t. 3, p. 67.)

When a limb is differently injured at the same time in two places, and one of the wounds requires ampu-

tion (suppose a wound of the leg with a splintered fracture of the bone, and a wound of the thigh, done with a ball, but without any fracture of the os femoris, or other bony accident), Larrey recommends to be first to dress the simple wound of the thigh and amputate the leg immediately afterwards, if the knee is free from injury. When it is necessary to amputate above this joint, the less important wound need not be dressed till after the operation, provided it can be comprehended in the section of the member, or be so near the place of the incision as to allow the incision. When the wound demanding amputation is the upper one, the operation of course is to be done above it, without paying any regard to the injury situated lower down.

Ninth case. In the foregoing species of gunshot wounds, pointed out by Baron Larrey, as urgently requiring immediate amputation, his own experience and the observations of Dr. Thomson justify me in adding compound fractures of the thigh among gun-shot fractures. I am particularly glad that the latter gentleman has devoted a proper degree of attention to these cases; for the operations which I find of judging when should, and when to believe, that military surgeons hardly yet sufficiently acquainted with the anatomy of these three operations in gun-shot fractures of the thigh. There were brought up to my hospital at Val-de-Aisne, in 1814, about eight of such cases, all in the worst state for an operation, because several days had elapsed after the receipt of the injuries. All these patients died, excepting one, whose fracture was not so above the trochanter, and I do not know, that he ever regained a very useful limb. Another died three hours removed by amputation from the danger of the injury; but was unfortunately lost by secondary hemorrhage about three days after the operation. The bleeding was almost instantly suppressed; yet such was the weakness of the patient, that the irritation of securing the vessel, and the loss of blood together, destroyed it in every stage of recovery. Were I to judge, then, from my own personal observations at the army, and from some other cases which I saw under my eyes, I should without hesitation recommend immediate amputation in all cases of compound fractures of the thigh, caused by gunshot, loaded balls, &c. If there are any exceptions to this advice, they are such as are specified in the article *Amputation*.

Two other fractures of the thigh (says Dr. J. Thomson) have been universally allowed to be attended with a high degree of danger; indeed, all of late years, very few instances have been recorded of recovery from these injuries. Reason acknowledges, that in his long and extensive experience, he had never seen an example of recovery from a gunshot fracture of the thigh; and likewise, in his calculations with regard to those who recovered from gun-shot fractures, he has added these of the thigh bone as being of a nature altogether hopeless. In the present improved state of military surgery, injuries not infrequently occur of recovery from this fracture; but of these the number will be found, I believe, to be exceedingly small in comparison with those who die, particularly when the fracture has had its seat above the middle of the bone, &c.

According to the observations of Percy, scarcely two of them recover of those who have suffered gun-shot fractures of the thigh-bone. Mr. Guthrie, who seems to have paid greater attention to this subject than any preceding author, says, that "upon a review of the truly cases which I have seen, I do not believe that more than one-third recovered to an useful limb; two-thirds of the whole died either with or without suppuration; and the limbs of the remaining third were not only badly mutilated, but a cause of great inconvenience to them for the remainder of their lives." — (*See Guthrie on Gun-shot Wounds*, p. 141.)

In fractures by loaded balls of the lower part of the thigh bone (says Dr. Thomson) recovery not infrequently takes place, and such Thomson and Mr. Guthrie conceive, that they are injuries in which amputation may be delayed with safety. It would be very agreeable, that this opinion should be confirmed by future experience; but it appears to me, that before it can be received as a maxim in military surgery, much more experience and positive observation than we yet possess, will be required with regard to the propriety of those who recover without amputation, or after secondary operations, and of those who escape after primary amputation. Of these who had suffered

this injury, he now comparatively had a small answer referring to Edgemoor, and they had been attended with severe local and constitutional symptoms." (See *Obs. made in the Military Hospitals in Belgium*, p. 487, 488.)

In the article *Amputation* I have described the manner in which this practice restores of several inches of length in the thigh-bone. This state of the bone, observes Dr. Thompson, could be only a consequence to recovery, and his conclusion is, that in general, even in fractures of the lower part of the thigh-bone, a greater degree of force will be necessary in military practice by amputation, than by otherwise, the soft without that operation. "When the bone appears, on a careful examination, to be broken without being much splintered, and when the patient can be removed easily to a place of rest and safety, it may be left to attempt to preserve the limb; but if the bone be much splintered, or if the consequence will be long and distressing, it will be more judicious, I am convinced, to amputate rather than, even in fractures of this part of the thigh-bone, to attempt without delay.

Muscle-balls, in passing through the fragment to the knee-joint, produce lacerations of the vessels, which generally communicate with the joint. These cases, like those in which the ball has passed directly through the joint, require immediate amputation.

The writings of military surgeons contain but few histories of cases in which the thigh-bone had been fractured above its middle by the passage of musket-balls. These are, indeed, few, which have generally had a fatal termination; and the danger attending upon the amputation which they require seems too long to derive different surgeons from attempting to discover what advantage might be derived from the employment of that operation. *Schlesinger* recommends, and states that he has practised with success, amputation in these cases in which a sufficient space would still below the joint for the application of the apparatus. It is curious to remark, in the history of amputation, how long surgeons were in discovering the ease and safety with which the femoral artery may be amputated by the diaphragm, or, as he in the passage over the hip of the pelvis. Nay, from the immediate danger, protracted suffering, and ultimate cure of cases, which he has observed to follow this kind of injury, argues strongly the propriety of immediate amputation. "Mr. *Thompson's* opinion, with regard to the desirability of these injuries, and the advantages to be derived in place from immediate amputation, coincide in every ground with those of *Schlesinger* and *Boy*. He observes, that those whose thigh-bone has been fractured in its upper part by a gunshot-bullet generally die with great suffering, before the end of the sixth or eighth week; and that few even of those escape, in whom that bone has been fractured in its middle part. Of the few whom we saw, who had terrible gunshot fractures in the upper part of the thigh-bone in Belgium, scarcely any are now to be seen in a favorable condition. In all the limbs were much contracted, distorted, and swollen, and sometimes had suppurated within the neighborhood of the fractured extremities of the bones. In some instances, these extremities had passed down the thigh, but more frequently they passed upwards and occupied the region of the hip-joint and pelvis. In several instances, in which recovery had been made for the evacuation of matter, disfractured and extruding extremities of the bones, sometimes contained, and sometimes following the whole of the bone, could be felt hard, rough, and extremely separated from the soft parts which surrounded them. In other instances, these extremities were partially enclosed in deposits of new tissue, which, from the difficulty thrown out, seemed to be produced in a marked degree. It was obvious, that in all of these cases, several months would be required for the recovery of the fractured extremities; that in almost every case pain and misery would be endured from the processes of suppuration, absorption, excretion, and growth of dead bone; that in some cases, the patients were actually great danger from blood-poison, and from the fact that the blood was necessary in order that they were debilitated, and that of those in whom this might take place, there was but little probability that they would be able to do more labor. The worst of these cases (says Dr. Thompson) made a deep impression upon my mind, and has tended to strengthen my con-

clusion that this is, of all others, the state of things in which immediate amputation is truly and properly required." (See this case in the *Military Hospital in Belgium*, p. 484-485.)

Dr. Thompson adds, that when the bone end of the danger of fractures caused by gunshot-balls in the upper part of the femur, is then in a still greater degree of those which have their seat in the neck or head of that bone. In such instances, Dr. Thompson joins the generality of modern army surgeons in strongly recommending amputation at the hip-joint, a notion of which I have already spoken. (See *Amputation*.)

ON SURGICAL WORKS IN WHICH DIFFERENCES MAY BE OBSERVED.

If, says Baron Larrey, it be possible to supply the needs in which amputation ought to be immediately performed, it is impossible to determine, in such cases, which will require the operation with certainty. One gunshot wound, for example, will be cured by ordinary treatment, while another that is at first less severe, will afterwards render amputation indispensable. Whether this be owing to the patient's bad constitution, to the feeble sympathy which are formed. However this may be, the only rule for guiding the surgeon that practice itself is, to amputate immediately in all circumstances in which every resource, as the bone is manifestly in vain. Upon this point Larrey's doctrine differs from that of Pagan.

Thompson's principles are admitted cases, which is some extent of the second kind, in which it allows amputation, not with any hope of curing the limb, but in order to let the first symptoms subside. The system here between the different, and sometimes day appears to have been diagnosed than when performed immediately after the receipt of the injury. At the early period, according to M. *Barre*, the condition continued by the gunshot injury is enlarged, the pain is excessive, based on laceration, the large portion of which the patient has been very severe, as a sign of the danger, the delay of the individual is an objection; and it is laid down as a rule, "in the consequences of every amputation, even in the first instance, are in general extremely dangerous." In support of this theory, M. *Barre* adduces a series of gunshot injuries in which, after the battle of Fontenoy, the operation was delayed, in order that it might otherwise be performed with more success; a plan which, according to the author, proved completely successful. (See *Prix de l'Académie de Chirurgie*, tom. 2, art. 18, item.)

This division of the cases for amputation into two classes, not consistent with justice, Larrey himself has been the cause of a great deal of dispute. Very early the partition of M. *Pagan* large one, and is made in the first instance in amputation. The history is that they are dangerous; while on other occasions they require amputation without any delay.

Larrey, after stating that the effects of amputation, instead of increasing, gradually diminish as it appears after the operation, continues to use together about the possible cause of the ill effects of amputation, which, as being well and satisfactory, I shall not here repeat.

Baron Larrey will not even admit that the patient's state ought to be a reason for postponing amputation, because the patient, just after the accident, will be much less afraid of the risk which he has to encounter, than at the expiration of the first hour and twenty hours, when he has had time to reflect upon the consequences of the injury or of amputation, a point made by the *Business Page*.

Experience agreeing with my theory (says Baron Larrey), however, both to the army and navy surgeons, that the bad symptoms which soon follow each gunshot injury, on their occasion the loss of a limb, are much more to be dreaded than those of immediate amputation. One of a vast number of the wounded who suffered amputation in the course of the first two and twenty hours after the memorable naval battle of the 1st of June, 1794, a very few lost their lives. The fact has been attested by several of our colleagues, and especially by *Perron*, surgeon of the ship *Le Jemais*.

The following is said to be an extract from one of his letters.

"After the naval engagement on the 1st of June, 1794, a great number of amputations were done immediately

after the receipt of the report. Many of the patients whose names had been thus noted were taken to the naval hospital at Marseilles, and put under the care of M. Duret. With the exception of two, who died of sepsis soon after they were moved, and there was one who had long been almost paralysed, the success of the Trepan, which was repeated by the English, was decisive, in compliance with the advice of their medical men, to defer the operation until many of the wounded could be sent off to the naval hospital; but he had the satisfaction to see them all die during the passage." *Am.*

Lafrey next explains us, that when he was sent to the army of Italy, in 1796, he had the pain of seeing in the hospitals great numbers of the wounded, full victims to the confusion which many of the surgeons of that army placed in the principles of M. Pons. General Bonaparte saw that the ambulance service was the only thing that, in the event of fresh battles, could prevent such a misfortune; and at consequence of his orders, Lafrey formed the three divisions of ambulances which are described in his *Mémoires de Chirurgie Militaire*.

Since that period it has always been customary in the French armies, on the day of battle, to make every preparation for performing amputations as speedily as possible. The next night of these ambulances (always attached to the advanced guards), says M. Lafrey, encouraged the soldiers, and inspired them with the greatest courage. On this occasion, the following anecdote is cited from Armande Pons.

"Five hundred warriors having been together sent for by the Duke of Brissac, besieged at Metz, to attend the wounded of his army, who were in great numbers, Armande Pons was chosen to the first advanced battery at the breach. Upon this, they immediately fixed the air with shouts of the most lively joy, and cried out: 'Glorious warriors plus vaillant, ils arrivent plus vite!' Their courage revived, and their confidence in this skilled surgeon contributed to the preservation of a place, before which a formidable army was defeated."

Lafrey desires us to interfere in the middle who have lost one or two of these limbs, and really will tell us that they seldom amputate a few minutes after the accident, or in the first hour-and-a-half hours.

"M. Pons now assigns six positions," says Lafrey, "I presented them to repeat to the first of battle the day after action; they would then soon be convinced, that without the prompt performance of amputation, great numbers of soldiers would inevitably lose their limbs. In Egypt this truth was generally acknowledged."

The following communication upon this point was made in France by M. Mestivier, a French surgeon on duty at Alexandria.

"In the naval hospital of this port I have seen three soldiers or sailors, who were wounded in the great attack off Aboukir, and who had suffered amputation in the first day-and-a-half hours. In two of these the operation had been done on the arm; in two in the thigh, and in three others in the leg. All three men are thriving. In the army hospital there have been only three such amputations, which were performed seven or eight days after the battle, and three patients died a few days after the operation, although the operation was done immediately, and no grave symptoms preceded at the time of the performance. You see, on experience that in this instance you cannot lose principles."

In 1806, during the American war, we are informed by Lafrey, that the surgeons of the French army performed a great number of amputations according to the system then generally adopted in France, that the operation should not be undertaken till after the subsidence of the first symptoms. Almost all the patients thus treated died after the operation. On the contrary, the Americans, who had the business to amputate immediately for in the first twenty-four hours) upon many of their wounded countrymen, lost only a very few. Yet M. Duret, at the time surgeon to the Spanish troops, and from whom Lafrey has collected this fact, relates that the situation of the hospital for the French wounded was, on many occasions, the most disadvantageous. (Lafrey, *Théor. Diagnost. méd. et chir.* 1802, a *Plan de Chirurgie*.)

Admitting that, by a concurrence of fortunate circumstances, which are not always to be obtained, symptoms arising from the change of the first

symptoms, as Lafrey remarks, this proves nothing in favor of doing the operation afterwards; it tends to show what nature just do towards the event of the crisis.

If, at the end of twenty or thirty days, the progress seems bad as it was previously, amputation is to be avoided. Thus all the sufferings which the patient has endured have been undergone for nothing, and the operation will now be attended with considerable risk, inasmuch as the patient may be in a dangerously weakened state.

Whether systems at all, we doubt the efficacy of the operation becomes more probable; but in this case the surgeon, instead of having recourse to amputation, should render his efforts to preserve the limb.

[Dr. Brown, of the U. S. Army, during the late war, described the head of the Veterans after a gun-shot wound received at the battle on Lake Champlain; and soon after, Dr. Henry Hunt, of Washington, D. C., removed the carious and necrotic suppurative of the scalp, the lateral end of the clavicle, together with a superior projecting portion of the os humeri, from the same patient. (See *Am. Med. Recorder* for 1858.)

In this case the limb was preserved by those bold operations; whereas, if amputation even at the time had been attempted, the patient's life might have been the result. — *Am.*]

ON THE REMARKABLE EXISTENCE OF ANEURISM.

Upon this subject Lafrey gives us the asserted formation.

First Case. A spreading Morbification. While disposed to refer to an internal and general cause, it would then be refused as the supposition to accept before either had put limits to the disease. Lafrey declares this kind of progress is better distinguished from that which is termed traumatic, by the symptoms which precede and accompany it. These symptoms are similar to those which are observed in aneurism, such as aneurism. Here the operation ought to be deferred, and endeavours made to combat the general system with regimen and internal medicines.

But when the progress is traumatic, Lafrey advises the limb to be immediately cut off above the disintegrating pain. Several facts in support of this doctrine are related by this experienced surgeon in his *Mémoires de Chirurgie Traumatique*. (See *Am.*)

In this part of the Dictionary will be found additional observations in favor of the practice adopted and recommended by Lafrey, which is in opposition to that advocated by Henry Hunt, and the generality of writers.

In the article *Amputation* I have noticed a particular case of gangrene, which has been noticed by Mr. Gifford, as denouncing the early performance of amputation and a deviation from the old rule of waiting till the circulation has ceased to spread. (See *Doctors on Gun-shot Wounds of the Extremities*, p. 55, &c.)

Second Case. Obstruction of the venous trunk. It is one of Lafrey's doctrines (though of a very questionable description), that amputation of the member, performed immediately after the first symptoms of febrile reaction, themselves, interrupts all communication through the system of the artery and the rest of the body. He states, that the operation immediately venous, and thus puts a stop to the system of the artery and to the circulation of the member. These first efforts, he says, are followed by a general aneurism, which produces the circulation, stops, and the regulation of every part of the system. He argues, that the whole of the traumatic pain caused by the operation must increase the existing aneurism; besides the interference of the venous trunk alone of laceration was bound to, and lower their vitality, especially when the principal vessels of the limb are strongly compressed. Nevertheless will be made as this old rule is the same. *Thibaut*.

Third Case. Bad state of the Discharge. It often happens that in gun-shot wounds complicated with fracture, notwithstanding the most skilful treatment, the discharge issues of a bad quality; the fragments of bone are surrounded with the matter, and have not the best tendency to unite; the patient is attacked with fever, and a colligative discharges. Under these circumstances, the only recourse to be pursued is amputation.

Fourth Case. Bad state of the System. It is probable, as Henry Lafrey observes, the case of aneurism, is sometimes produced as a result of a bad system.

tended by the introduction of an elastic gum catheter, the size of which is to be increased gradually, until the largest can be passed, when the foreign substance will readily enter the ureter, or pass on through the dilated urethra. In this way HENRY LARREY has saved great numbers from a very kind of suffering. (*Ann. de Chir. Mil.* t. 4, p. 302.) In such cases, the urethral syringe made by Mr. WERE might often be used with advantage.—(See *Ephemerid.*) When the ball is too large to be taken out in this manner, the lateral operation is to be performed, and it ought to be done before the bladder falls into an elevated or gangrenous state, from the pressure and irritation of the foreign body. However, as wounds of this organ frequently give rise to dangerous inflammation, Larrey recommends this operation to be done either before or after, to cut off all the consequences.—(*Op. cit.* p. 269.) In fact, almost all the operations of this kind we record have been done some considerable time after the receipt of the wound, and to this practice my own judgment would lead me to give a general preference. In one case, however, LARREY operated on the fourth day after the receipt of the wound, and with success.

After the battle of Waterloo, I was left a little surprised to find, in the *St. Elizabeth Hospital* at Brussels, a considerable number of cases, in which either the ureters, the stomach, the omentum, or the bladder protruded. I think we light in the division under Mr. COLLIER and myself, not long after these operations of the bladder. As before which I referred to just the injury in the field on the 21st of June, deprived me of the opportunity of witnessing the progress and termination of these interesting cases. However, many had ended fatally before my departure from Belgium.

GUN-SHOT WOUNDS OF THE UTERUS.

Wounds of the uterus, distinguished from other gunshot wounds, are now well known and to be always fatal. Balls have been found in the substance of the uterus after having lodged there twenty years, during all which time the patients were healthy, and free from symptoms indicative of the event.—(*Arch. Med.* t. 3, p. 25.) Mr. HENRY had some reason to believe, that wounds of the uterus made with balls were generally less dangerous than such as were made with sharp-pointed instruments; he had seen several patients recover after they had been shot through the uterus, while other persons died of very weak wounds of these organs, done with wounds and bayonets. Perhaps the cause of this fact may be owing to the circumstance of gunshot wounds generally throwing less than other wounds, so that there is not so much danger of blood being effused in the cavity of the chest or the pelvis of the uterus. The introduction of the cavity of a gun-shot wound into the body, is also another circumstance that favours the recovery, as whatever further happens to be distinguished has plentiful opportunity of escaping.

But there what has been stated, it would not be inferred that gun-shot wounds of the uterus are not incompatible with a various degree of danger. Frequently the patient expires instantly, being suffocated in consequence of profuse hemorrhage from these organs; for though it is true that gunshot wounds generally do not bleed much when the injured vessels are under a certain state, yet the contrary is the case when the wounded vessels are like those strained towards the top of the lungs. Gun-shot wounds of the chest also often prove fatal by the inflammation that is excited within this cavity.

Apparatus sometimes create a belief, that a ball has passed, completely through the chest and lungs, when the fact is otherwise. Thus, as Dr. HENRY observed, I have traced a ball, by description, passing into the cavity of the uterus, making the extent of the lungs, penetrating nearly to the point of exit, and giving the appearance of the men having lived and moved about, while bloody spots seemed to prove the fact, and in reality revealed the same, however, is a certain extent, as necessary as it is the case had been what was supposed. The bloody spots, however, were only secondary, and neither so active and alarming as those which were at at once from the lungs when wounded.—(*Medical Repository*, p. 208, et. 2.) A second case of abortion in the frequent long course of a ball, round the chest under the skin and muscles, previously to its exit, whereby an appearance is presented, as if the patient had been shot through the

thorax. And another source of deception, as to the actual penetration of balls, is, "where they strike against a ligamentous, artery, vein, &c., and are driven on, as if they were in their solid, a puncture which has escaped M. LARREY, who gives an interesting notice of it in the *Bulletin de la Faculté de Médecine*, Paris, 1818, No. 5. I have also given an instance in the preceding pages."—(*Ann. cit.* p. 317.) In these cases, the absence of bloody expectoration directly after the injury, the undisturbed state of respiration, and the gross freedom from oppression, anxiety, syncope, and other symptoms, than it comes where the lungs are shot, form grounds for a correct opinion on the true nature of the accident.

It is easy to suppose that adhesions always take place round the opening of a gun-shot wound into the chest, because the lung must necessarily collapse, and become considerably contracted from the pleura, especially when the communication established between the atmosphere, air, and the cavity of the thorax is very free and direct. However, adhesions are extremely common between the outer surface of the lungs, and the outer surface of the pleura viscosa, they would be easily torn away before the receipt of a wound, and, of course, prevent the usual collapse of the lungs.

As the general symptoms and treatment of wounds of the chest are detailed in the article *THORAX*, I shall not here detain the reader long upon themselves. When a patient has light shot in the chest, the most important assistance is to prevent and reduce inflammation of the lungs and pleura. In few other cases is respiration and large breathing to be so advantageously promoted. Here there will not be so much danger of an extravasation of blood as in others, and even if the nature of that shot were to happen within the cavity of the pleura, the opening would generally be sufficient for its escape, and it would not be so frequently necessary to drain the wound or make a new opening, as when the injury has been induced with a sharp-pointed weapon.

In this last kind of case, when attended in the best manner with bleeding, Henry Larrey particularly dwells upon the advantage of immediately bringing the sides of the wound together with adhesive plaster, bound or leaving it open, as directed by the generality of writers, and he recommends to pour, that this immediate measure of the wound has good effect in stopping the hemorrhage from the pulmonary vessels. Proceeding to extravasation of blood in the chest were to follow, it argues that it would be better to let it out and afford it a suitable issue, than to suffer the patient to perish of hemorrhage at once by his coming too much. (*Ann. de Chir. Mil.* t. 4, p. 151, et. 2.) Dr. HENRY is in favour of the same practice.—(*Medical Repository*, p. 272, et. 3.) As a penetrating gun-shot wound of the chest, after taking away from parts so often closed if blood, the surgeon should attend all symptoms of inflammation and effusion of blood within itself, and not direct the external wound like his patients, if he really expects to destroy the disease by this means. The patient may rest in comparative tranquillity, and the spilling of blood, and danger of effusion from internal hemorrhage come to rest, when no direct issue is again employed; and if by this management, repeated as often as circumstances demand, the patient survives the first twelve hours, lungs and lungs is disappointed of his proceeding from those various effects of hemorrhage? and what other danger is there, as Dr. HENRY truly observes, as he knows it to be only those which can cure him. Afterward, when the paroxysms of pain, the sense of suffocation, and the nature of hemorrhage have become more considerable may be prevented with the most successful result, but if the cough be very troublesome, or some case is more fatal than the symptoms suggest with squam. With this treatment kept so constant the exhibition of saline purgatives, expectorative syrups, and a strictly low diet, the patient being allowed no sleep.—(*See Medical Repository*, p. 272, et. 3.)

When water enters the thorax, it is considered gun-shot wounds, the opening will generally follow in its escape; but should the collection of air be confined, and because dangerous symptoms, the chest would soon either be enlarged, or a new incision produced, as circumstances may require. The work of making an opening into the chest is considered in the *Article Pneumothorax*.

When a ball lodged without falling into the river, it may be either in the stomach or in the bowels of the patient between the epiglottis, or it may be in the intermediate space, and sometimes above a very long time without causing much inconvenience or leading to any serious results. But when it is ejected at the throat or cavity itself, it depends on the weight and compressing capacity of the foreign body. In some cases, it causes considerable difficulty in deglutition, extreme and constant oppression; in others, if the stomach can be accommodated, there being temporary distention, it causes no result. In an early stage of the disease, it says that the inverted stomach will often be weak enough to let the ball pass slowly; it, but that, at a later period, that same stomach has become, and it will be necessary to cut away a portion of the upper edge of the rib with a bistoury, after which it will be preferred to a tracheotomy now. This advice is supported by some very interesting cases. (See *Annals of Chir. Med.* &c., p. 282.) Frequently the ball fractures the rib and, with the aid of dilators, sufficient room for its extrusion may be made; but the possibility and security of operation, if through the surgical opening, will, of course, depend upon the situation of the foreign body, and the urgency of the symptoms. A case is recorded in which a ball, weighing seven ounces and a half, was thus removed.—*Med. and Surg. Jour.*, vol. 3, p. 300.

[illegible]

de Nomenclature d'après une convention internationale, and quasi anonymous; *Wells*, 1781: this work is only based on a long-suffered visit to Germany for the first and severe criticism of Pott, Le Catroux, Moreau, et al. *Mémoires Chimiques de Chaptal*, 1800. Von Gersdorff, Abhandlung von der Nothwendigkeit der Analeptica; *Frankfurt*, 1775. M. G. Dumas, *Résumé Indispensable sur le Service des Malades Militaires*, 2^o Part, 1780. Moreau, *Manuel Militaire-Chirurgical des Blessures*, 2^o édition, 1818. *Revue*, 1796. *Walden's* Nachricht über das Fracturen, Verwundungen, euerst Leipzig, 1797. Baron Pott, *Manual der Chirurgie*, *Carlsruhe*, 1800. *Perrin*, 1792. *Moreau*, *Compende de Clinique*, *Paris*, 1800. *Revue*, *Verroux* sur des Abus des Grosses Quantités, 4^o *Belle*, 1812. *Amalut*, *Mémoire de Chirurgie*, 4^o *Milieu*, 1812. *Revue* on *Gunshot Wounds of the Extremities*, *London*, 1815; at the 2d ed. entitled a *Treatise on Gunshot Wounds*, 2^o *London*, 1820: a more detailing the practice of our military surgeons during the late war in Spain, and repeats both valuable information. *Tremblay's Report of Observations made in his Military Hospital in Belgium*, *Gillsburgh*, 1810. J. C. *Mahomed's* *Practical Illustrations in Surgery*, 1809; and *Further Observations on Amputations in Gunshot Wounds*, *London*, 1817. *Muller's* *Manual*, 2^o *London*, 1813. J. *Brown's* *Principles of Military Surgery*, 2^o *edit*, *London*, 1829; a publication which I cannot too strongly recommend, as not only a good and very complete, but in practitioners in general. *James Mason*, *Art. Sketches of the Campaign of 1822*, 13, 14 (which are called *Surgical Cases*, *On the Military Hospitals in Spain* *Wounds*, *Amputations*, *et c.*).

GUPTA SIRENA A fern seed to have been first sown by Actinaria to amuse him, or the species of him, from arising from a world state of the resin or optic nerve. (See *Amusements*.)

In the present place I mean first briefly to advert to a case which the late Mr. Ware has described as conducted with a particular kind of propriety, that occasionally excruciating pain, and several peculiar troubles. One example of this kind was gently relieved by a structure made through the nostril, introduced into the ball of the eye with a grooved handle, somewhat larger than a common-sized smoking pipe, twenty in the past where this instrument is introduced in the position of depressing the cornea. Through the lower of the instrument, a wad of lint is immediately sent, which was not unlike that which Mr. Ware would give. Some of the death ensued between the second cure and still in cases of still some. After the pain of the operation had ceased, the patient became easy, and the inflammation soon subsided. Mr. Ware afterwards performed a similar operation in a remarkable number of scabulous ulcers, and in several of these the proceeding was attended with almost instantaneous good effects.—(See Ware on the Operation of Faradizing the Cornea of the Eye, in the *Journal of Medicine*, &c. and in the *British Review*, incorporated into *Pain and Insensibility*, &c. &c.)

Enter the head of state, which I assumed to receive her's various nonverbal, automatic reactions, which I divided into two classes, viz. general or internal ones, and local or external. Sometimes only the first is psychic; the second, rarely, only the second; but frequently both together.

making the *Chlamydomonas* fast growing, which may mean it is free from a virus or real contaminants, as an existing disease. It was Roy's opinion that for the purpose of making actual vaccines they should be infected only when the monkey is dead, and not vaccinated by these means; and he drew these appropriate manner by goat vaccination of blood to the head and eyes prevails, or any increased virulence of the system. Should the viruses find it necessary to employ specific treatment, simply an alternative, he must consider too whether the vaccine viruses will have any gross and long continued operation. (Latter part of January, 1922, p. 103.)

Notwithstanding the favorable accounts given by Schneider, Huber, and others of the good effects of vaccines in many cases of infectious disease, the treatment has had but little success in England. Mr. Travers says elsewhere that there has resulted an outbreak of clinical human measles in London, although he has fully tried it. "The use of passive disease, in which it is generally made.

should thus be relieved without with antiseptic treatment, which is especially indicated where there is reason to believe that the granules have been produced, and partly produced, by a long interruption of the catarrhal secretion.

First says, that symptomatic means are attended with the most blunted good effects in that stuporous weakness of sight which sometimes occurs towards the end of pregnancy, and is combined with obstinate constipation, cerebral headache, violent determination of blood to the head and eyes, and such an extraordinary dilated membrane to explain. On the other hand, the employment of counter-stimulant remedies, as leeching, is, in precisely useful in hyperæsthetic and hysterical catarrhal conjunctivæ, when they are treated with much general energy and vigour of the treatment—(Vol. vi. p. 673.)

According to the statements of the same writer, heat, whether warm or cold, adapted for the whole body or to the form of a compress, a friction or affusion, have likewise not proved very efficacious remedies for strabismus; and that, whether they consist of simple water, or aromatic decoctions, or of waters impregnated with sulphur or iron. The means only tried in general are less frequently employed, as empirical remedies in cases of strabismus, and why they are still more rarely successful, may be because in the very cases of strabismus in which both of various kinds are clearly indicated the greatest attention must be paid to the patient's constitution, to the state of the vital system, and to the disposition of the fluid employed; for, as a healthy subject, too warm a bath, even under strabismic circumstances (as the fulgure, when there is phlogosis), or too strong a current, may produce strabismus; and therefore, under similar circumstances, it may be likely to increase any pre-existing strabismic tendency or might into complete blindness. In general, baths of sulphur-baths may be employed as empirical remedies in strabismus only when the regular action of the skin is disturbed, without other symptoms, when the affection of the eye is not hindered by the rapid escape of a profuse perspiration, or some catarrhal effusion is combined with the strabismus. On the contrary, perfusions with salt, nitrated, Ac. are equally proper when strabismus is accompanied with a determination of blood to the head and eyes, or any local inflammation, after which the eyesight is always found to be more. In cases of strabismus, affusion can be useful even empirically, and only under those circumstances where modern experience has proved the shower-bath to be efficacious. Cold bathing generally agrees best with an anæmic patient, and when his skin is extremely sensitive, when washing pains are felt between the superciliary and nostrils, or there is a tendency to erysipelas inflammation, the power of cold, evidently declines after every trial of the plan. But, according to Boer, mineral waters impregnated with iron in the form either of a bath, or use full or for the whole of the body, generally produce, under these circumstances, the most favourable effects upon the skin, and through the medium of it, upon the diseased eye. The case, however, also is accepted where flying rashes, and perhaps pox, pass over the face; the patient, under such a plan, and when bathing of the whole body in sulphurous mineral water should be pursued—(Lect. res. des. Journ. 2, p. 471, 472.)

If we are to believe Boer, the empirical employment of applications which have the effect of increasing the secretion of humors is very seldom proper, such as irritating farinas, the smoking of saltpetre, and mustard, &c. neither does cold only be adapted with any prospect of benefit, when strabismus is accompanied with phlogosis, a series of spots and would avoid the frontal sinuses, an abundant, often profuse at the sides of the nose, and lateral crysals of the nose, in an individual who has frequently suffered catarrhal conjunctivæ, but some have previously to the origin of the strabismic symptoms had suffered nearly or quite free from such; and when the patient has no tendency to phlogosis, determination of blood to the head and eyes, and tenderness of the strabismus—(Vol. vi. p. 473.)

The application of counter-stimulant remedies to the nose, in perhaps, to be regarded as a mode of treatment established on empirical principles, when we can place confidence in the statements of A. Leake, Richter, and Boer, that an increased crysals of the nasal membrane

of the nose, following fatigue and wear in strabismus, may have the effect of inducing anæsthesia. The case is played by Richter's following compound: R. Mucos. vir. 3i. Sacchar. alb. 3ss. Inf. alb. and rectify a 274 Mf.

The late Mr. Ware required considerable efficacy to destroy and a secretarial staff in cases of gummy eye. The word was composition of the grains of yellowish phlogistic sulphureous, well mixed with about a drachm of the purest succinate, glycerine, or common wax. A small piece of this stuff taken up the nose, as found in strabismus it was immediately; sometimes exciting swelling, but in general producing a very large discharge of mucus—(See Lib. the. vol. 2, p. 474, 475.)

Among the remedies which are intended to be applied directly to the eye and its surrounding parts, local bleeding, made by the fistula, is the extraction of blood by means of leeches, or by cupping the temple, is the only mode in which the matter can here be executed. This method, however, is only proper when violent influences of the result of the congestion and inflammation is combined with a feeling of constant pressure about the eye, a sense of fullness and tension in the ball, and violent pulsations, without any local inflammation or increase in the velocity of the circulation.

Appropriate phlogosis also, says Boer, that the empirical application of tubercles, or drying plaster, to the temples or eyebrows is thought well, but less efficacy when all sensibility in the retina appears to be extinguished, when any action in the vessels of the eye, and various characters of the blood-vessels, or any peculiar determination of blood to it. Appropriate phlogosis or determination of blood, including both internal and external anæsthesia, may be advantageously employed upon the eyelids and temples, when there are grounds for believing that the functions of the skin have already been long suspended by phlogosis, or the absorption of perspiration on the forehead—(Boer, Lect. res. des. Journ. 2, p. 474.)

As in the various plan of treatment, the rubbing of fluid, pungent or irritating substances upon the eyebrows, in certain kinds of anæsthetic blindness, is often attended with considerable efficacy; so, in Boer's opinion, it should not be neglected in cases where the subject is susceptible to have recourse to stuporous methods of cure; for instance, when it is observable that generally in the evening, or the night, the eyesight is more or less restored; that in the patient's first waking in the morning, it is weaker than in the middle of the day; and what particularly recommends, while the case is attended with any sensation of imaginary flames of light; a very light or merely shaded vision of the iris; or the least vestige of any defect in the structure of the eye; and no symptoms of determination of blood to the head and eyes, or of a general tendency to inflammation. Boer recommends pungent applications to be first tried, such as the spiritus aromaticus, or tincture of opium. These may be followed by appropriate anæsthetics, as the spiritus aromaticus, like the tincture of opium; and finally, by irritating remedies, like the tincture of iodo. The nature of iodine I should also consider an application well-deserving of trial. These applications which are applied in the form of vapor to the eye demand greater circumspection, like naphtha, the liquor arsenicus, &c. These may be best applied, by putting a small quantity of them into the hand, over which the eye is to be held in such a manner that some of the fluid will come into contact with it. That as soon as the eye begins to be irritated by the vapor, the hand to rise, or actual pain to feel, the hand is to be removed, but too much irritation be produced—(Boer, vol. 2, p. 475.)

Not only in the rubbing, but also in every scientific mode of treating anæsthetic eyes this author, with commendation, is intended to produce a shock upon the nerves and vessels, require the utmost caution. Because, of all the various causes of anæsthesia, they are the most powerful; and consequently, if a shock, any likely to produce an anæsthetic weakness of sight, or complete blindness. This anæsthetic event is most rapidly produced when applications of the description are employed in patients subjects affected with partial determination of blood and local inflammation, a various state of the blood-vessels of the eye, defects in the transparent parts of the organ, or frequent anæsthesia. To the class of remedies being especially the

The next example reported by Port and Richter as a form of haemorrhoids, is not admitted by Richardson, *Journal (New York) des Sciences Méd.* 1. 50, p. 120, and other modern surgeons.

"It," says Mr. Port, "should be extravasated within the uterus, vagina, or proper out of the os uteri; it constitutes a great relaxing and (as it were) extension of part of the vascular compass of that gland, and the quantity is considerable. It will afford to produce a distention in the hand of an examiner very like to that of a lymphoid or tumorous growth; allowing extension for the different density of the different fluids, and the greater depth of the former than the latter."

If this is nothing for a vesigo-haemorrhoid, and an opening to exist, the discharge will be blood; not fluid or very thin; not like to blood circulating through the proper vessels; not dark and dirty in colour, and mostly of the consistency of thin clots (like to what is most frequently found in the vaginae vaginalis). The quantity discharged will be much smaller than when passing from the size of the vessel, which was not so considerably diminished. When this small quantity of blood has been so derived off the vessels will, upon examination, be found to be much larger than it ought to be, as well as much more dense and dirty. Instead of this tenderness and resistance arising from a healthy state of the gland, within its firm strong coat, it is soft, and capable of being compressed almost flat, and that generally without any of the sharp and lancinating which always attend the compression of a sound testicle. If the bleeding occurs upon the withdrawing the os uteri, surprising a froth to have been found with the peritoneal folds, a fresh accumulation of the same sort of fluid is soon made, but the same degree of tenderness is produced as before the operation; if the os uteri does not close, the haemorrhage continues, and very soon becomes alarming."

"In the first two species, the blood comes from the uterus vaginalis, the vessels itself being cut and extravasated, and the tendency is toward the cavity of the testis there; but in this the haemorrhage comes from the substance of the testis, from the vascular fluid of the spermatic artery within the tunica albuginea; the direction of the vaginal coat can have no good; and an unusual trade into the spermatic can only increase the mischief; the testicle is applied, or removed passive, by this kind of attention made to it previous to the extravasation; and insertion is the only cure which a patient in such circumstances can deliver upon."

I confess that no good reason appears for arranging cases of the preceding kind with haemorrhoids, for what else they but diseased testicles which have been penetrated, either on account of their tendency to rupture, or early having within them some other fluid with a morbid colour or other fluid, as I have seen in boys, drops of testicles, of spermatic, and whenever blood is extravasated is not extravasated in the substance of the testis, but in the peritoneum, but seems to be a necessary consequence of that proceeding; however, at the propriety of the practice advised by Mr. Port, no doubt can be entertained.

The last species of this disease noticed by Mr. Port seems from a bursting of a branch of the spermatic vein, between the gland and scrotum, in what is commonly known by the name of the spermatic plexus. This, which is generally produced by gross or sudden exertions of strength, leads of injury, &c., they happen to persons in the last hours, whose blood and gases are in morbid order, and whose genital parts are free from blood or disease.

The effusion or extravasation is made into the cellular membrane, which invests and surrounds the spermatic vessels, and has sometimes the appearance of a true liver. When the case is clear, and the extravasated blood does not give way to decomposition, the only remedy is to tie the spermatic duct upon the whole length. If the vessel or vessels be small, the haemorrhage may be restrained by mere compression with dry lint, or by the use of styptic; if it be large, and these means do not succeed, the ligature must be made use of."

I cannot conceive, Port in ignorance of a third report of one of the spermatic veins, it was ever to be put aside while the whole spermatic duct, and this is better confirmed, though Mr. Port advises this plan. In case the

bleeding length cannot be tied singly. Diseases of the plexus, and an unusual plexus, still almost always depend the swelling, and if not, opening it, taking out the blood, applying cold, or, if necessary, tying the cavity with lint, and using compression, would be, according to my humble judgment, the most judicious treatment.

A consequence of the latter kind is not very common, yet Mr. Port has not created it as one of his forms of haemorrhoids; but why he has not taken notice of the most frequent of all the varieties of the disease, I am at a loss to comprehend; I mean the extravasation of blood in the loose cellular membrane of the scrotum from injury on the part, and sometimes from intemperance, castration, &c., quite unconnected with any rupture of the spermatic veins. "These are the cases which are mostly met with in practice. I have seen them followed by suppuration; but in general the effused blood is gradually absorbed, with the aid of external applications, leeches, incisions, potasses, and saline purges. A surgeon should generally be reluctant to lay open the scrotum, as it is thus situated, absorbing and very severe symptoms have been the result."

Cases and Patients. *Scrotum* are the best of the old writers on haemorrhoids. For modern information, consult Pott's *Cases*, Warton's 2. B. 2d, *De Haemorrhoidibus*, Pott's, *Tractatus de Haemorrhoidibus*, 2. Richter, *Anfangsgr. der Heilkunde*, 2. B. Richter, *Neurologische Clinic*, 2. B. *Chirurgie*, in *Neurologische Klinik*, 2. B. 2d, p. 305; the patient died after an operation; but here water in the scrotum. *Pott*, in *Ann. de Med. moderne*, vol. 12, p. 122; a case from scrotum, cured by an incision. *Harris*, in *Mémoires de Med. Moderne*, vol. 5.

HARE-LIP. (*Labiæ Lepræ*.) A fissure or permanent division of one or both lips. The term has arisen from the fissured appearance of the part to the upper part of a lip. Ordinarily the fissure is more or less oblique. In general, it is directly before the apex of the nose; but sometimes it corresponds to one of the nostrils. The two portions of the lip are generally movable, and not adherent to the secondary process; in some instances, given they are closely attached to the bone part of the jaw.

Children are frequently born with this kind of malformation, which is called a natural hare-lip, while that which is produced by a wound is called acquired. Sometimes the portions of the lip, which ought to be united, take a considerable distance between them; while in other instances they are not much apart. The cleft is occasionally double, a little hole or small portion of the lip being situated between the two fissures.

The fissure constantly affects only the lip itself, and usually the upper one. In many cases, however, it extends along the bones and soft parts forming the palate, even so far as the trachea; and sometimes those bones are greatly wasting. In a few instances, the jaw not only is imperfectly ossified in front, so that a cleft passes through them, but one side of it projects forward, and is at the same time inclined too much outwards, drawing with it the corresponding part of the palate, and the septum nasi, so that a very strongly distortion of the postulated nose is produced. The nose, I believe, has not been described in surgical books.

A hare-lip, in its least degree, occasions considerable deformity; and when more advanced, it frequently hinders infants from sucking, and makes it indispensable to sustain them by other means. When the lower lip alone is affected, it is always seen as a malformation, the child was either retained natural, or born to speak, except with the greatest impediments. The constant escape of the saliva, besides being an annoyance, is found to be detrimental to the health; for its loss impairs the digestive functions, the natural mucus secreted, and even death would sometimes ensue, if the frequent discharge of so necessary a fluid in the nasal cavity were not prevented. Thus, a lady, who was in this state, consulted Tronchin, who immediately saw the cause of her indisposition, and recommended the fissure in the lip to be secured; the operation was done, and the dyspeptic symptoms then ceased. And when this disease penetrates the palate, the patient not only suffers very grievously, but cannot swallow, nor swallow, except with great difficulty, on account of the food easily going up into the nose.

An early removal of the deformity must obviously be

very desirable, but, as it cannot be accomplished without an operation attended with some degree of pain, Dumas, Chevreton, and others advise waiting till the child is four or five years old, on the supposition that, at an earlier age, the child's agitation and cries would render the operation impracticable, or damage all the proceedings taken to ensure its success. It is plain, however, that such reasons are not of great weight. A child, near to five years old, and very often even one eight or ten years of age, is some difficult to manage than an infant only a few months old. Every child of the above age has, I thousands have more dread of the pain, than of the deformity or of the inconveniences of the complaint, to which he is subjected; while, in fact, of tender years bears nothing and only feel the pain of the moment.

A more rational objection is the liability of infants to convulsions after operations, and this has indeed nearly occasioned me to postpone the cure of the hare-lip till the child is about two years old. This opinion is now sustained by Sir Astley Cooper, who mentions in his lectures several instances, which, like other leeches communicated to him by others, or have occurred in his own practice, where operations for the cure of hare-lips in very young infants have had a fatal termination, in consequence of an attack of convulsions or diarrhoea. The period when duration is completed, at the age of two years, he therefore recommends as the age of advantage for the operation, and if parents ever so being done earlier, he very properly advises the attempt to let them be fully apprised of the risk, at this is the event of the child being cut off, he may not term him for having operated at an unduly early period of life.—(See LANCET, vol. 3, p. 108.) The latter end of 1832, I met Sir Astley Cooper in consultation in a case where this objection occurred. The deformity was particularly knotty, in consequence of the upper jaw-bone being imperfectly united to itself, and the side of it forming a considerable protuberance forwards through the lip, which extended up to the nostril, at the same time that the nose was seriously distorted to one side of the face. The parents, persons of the first respectability, were therefore unanimously advised as for surgery operations, were instances of the success of which in very young infants had already been communicated to them by their friends. The projection of bone, they had now learned, might be cut away, so as to permit the soft parts to meet, which they now would not do. The risk of an operation on the infant in question, then scarcely two months old, was fairly explained to the parents, but I doubt whether they could have been prevailed upon to wait three months longer, had not Sir Astley Cooper recommended to them the disadvantages of waiting away the best period, and urged the advantage of a little time to ridage the protuberance by means of pressure. As I had not had any previous conference with Sir Astley on the subject, I was particularly gratified in finding his advice agree precisely with what I had already given, when the case was first shown to me. Exactly when the infant was five months old, a period selected as beyond all the danger the infant previously to the total time of the cure, notwithstanding the absence of dentition, I performed the operation in the presence of Messrs. Jern, of Chertsey, and Mr. Ives, jun., of Chobham. By this time the nose had been so effectively depressed, by means of a kind of splint, constructed by Messrs. Searles and Ives for the purpose, and worn several hours daily, that the soft parts situated of better brought into it with tolerable facility. Union followed very well, and, though it was open to the worst hare-lips ever seen by Mr. Ives, senior, or myself, without an extensive division of the lip, the improvement is now very great, and the strong depression of the nose constantly obliging further depression, in proportion as the jaw recedes whilst the pressure of the apparatus, which is still retained.

This is the youngest infant on which I have operated, but, in October, 1831, I performed the operation on a infant twelve months old, at White's Tavern, where I was kindly assisted by Mr. Birdwell, surgeon in that town. Union took place very favourably, without any inflammation whatever. Only one jet was used at the lower part of the lip, as I found that the upper part of the division could be perfectly and readily closed with a strip of adhesive plaster.

Mr. Searles observes, "through every lip where the

loss of substance is so great, that the edges of the tissue cannot be brought together, or at least when they do but just touch, in which case it would not be without its peculiar advantages. It is likewise useful in young children, and with reason, if they suck; but otherwise it may be associated with great safety, and even with more probability of success than in infants that are older."—(Lectures on Surgery, chap. 24.)

Dr. Ross conceived the operation on children at an age even as those in the breast. He held out a great success on infants only three months old. With respect to it to be undepended on soon as the child is six months old. Rossington operated on Thomas, a female after birth, and all the consequences followed her singular debility and nervous. An essential step to the success of the operation, is the management of the children from infancy, a judicious length of time before it was undertaken, a story that they might fall asleep immediately afterwards, and with the same view others have been modified.

Putting out of consideration the parents' interest, which has attended the use of blistering plaster for raising the edges of the fissure raw and capable of union, all practitioners externally the same treatment with regard to the aspect of the operation, which consists in raising the protruded portion of cartilage to the side of a single wound, by cutting off the edges of the separated parts through their lips, and then bringing those parts in contact until they have mutually grown together. But although such practice has been generally admitted, there have recently been differences of opinion with respect to the best method to be followed in practice; some operators having preferred sutures for keeping the edges of the wound in contact; while others disapproved of this, saying that a perfect cure might always be accomplished by means of adhesive plaster and a strong bandage, it is to give the patient from all the pain and uneasiness of surgery.

Mr. Evans thought that the use of sutures in the operation for the hare-lip, proceeded from a false idea respecting the nature of the disease; for the fissure in the lip being well adapted to loss of substance, it was deemed expedient to keep the parts in contact, except by a suture.

"The separation of the edges of the fissure in the lip," says Mr. Lucas, "is only the effect of the traction of the muscles, and is always proportioned to the extent of the cleft. Persons with hare-lips are capable of bringing the sides of the fissure together by muscular action, by puckering up their mouths. On the other hand, the separation is considerably increased when they laugh, and the breath appears constantly large after superficially paring off the edges of such cases. The extension in the hare-lip need not, therefore, be confined to a loss of substance. This truth is confirmed by the effects of strapping plaster, which has sometimes been applied to the hare-lip, as a temporary measure before the operation, and which usually increases the separation of the parts.

According to the contents of all who have written in favour of the rectified suture, it seems to me only as the false idea, that the hare-lip is the effect of a power of less loss of substance; and they say, positively, that we must not have recourse to it when there is only a simple division to be united. The rectified suture must then be preceded from the operation by the natural hare-lip, since it is proved that the rectification is attended with loss of substance. At the same time, a loss of substance is far too real, and the extension of cartilage and substance fissure, in which the lips are very united. Yet, even in some cases, the extensibility of the lip allows an attempt to be made to remove the fissure by means of the former has been entered, and it is enough to find the result satisfactory, when care is taken to direct such incision obliquely, so that both of them form, when they meet, a sharp angle, is the base of which the fissure is extended. Here the means of union might be the best effect, because the difficulty of keeping the edges of the wound apposed is greater. Mr. Martin, in his memoir on the strapping plaster, when speaking of the hare-lip has strongly expressed, that they are badly-considered means, and more harmful in proportion as there is a greater loss of substance, because the greater the interference is between the two parts, the more fear is there of their effects on the

needles or pins left in the wound. Hence, care has always been taken to make the drawings and the operation of the suture. After this consideration, judiciously made by the persons of this plan, there was only one thing left to be done, according to M. Pilon, in order to ensure the success of the operation. The use of copper bandages described by Yrizar and Naub, for compressing the cheeks; the change of linen; and strips of adhesive plaster; are all daily necessities for the support of the plan, and keeping them down being neglected. When the suture failed, it was by these means that the original defects were removed, together with that produced by the laceration, which would not have occurred without the suture. As then, the drawings, when judiciously applied, are capable of effectively removing the mischief of the suture, M. Louis ignores, why should they be considered only as a resource in a mere accidental case? Why should they not be made the chief and primary means of restoring the lip, even when there is a loss of substance?

Nothing can be opposed to the plan, added any thing more. They are well drawn from the pencil of those who have employed suture without success. Such persons have themselves furnished the proofs of the bandages being capable of improving the treatment made from the treated suture.

M. Louis, with a view of perfecting our notions on this matter, has it down as a first, that the retention of the suture being the cause of the separation of the edges of the fissure, it is not to these edges we are to apply the force which is to draw them; but that it should be applied chiefly to the very parts, where action (the cause of the separation) is to be opposed, and where contraction is thus to be prevented. A great many notions for supporting the wound, only divide dissensions and cause them to arise, and this thousand which we should endeavour to overcome. The means of preventing action can only be intellectual, when directly employed to prevent action, again afterwards application in the point where it is to be resisted. The facility with which the parts may be brought forwards, so as to bring the two commissures of the lip into contact by the mere pressure of the hands, shows what may be expected from a very simple apparatus, which will excite the same effect without any effort, is a firm and permanent master, and which will render suture unnecessary, the inconvenience of which are well known.

M. Louis, after having explained the reasons of the theory on which he founded his method, relates several cases, taken either from his own practice or that of others to illustrate the advantages. He details the history of twenty cases in which his plan perfectly succeeded, both in accidental lacerations, with considerable loss of substance, and in natural ones. In most of these instances, however, it was thought proper to secure the bandage with one stitch at the extremity of the fissure, close to the vermilion border of the lip, for the purpose of keeping the parts securely on a line.

Notwithstanding the operation as performed with the treated suture is opposed, by an authority of such weight as that of M. Louis, still it is the method most commonly practiced. No modern surgeons doubt that a lip may be cured by means of adhesive plaster and making bandages, as perfectly as with a suture; and all ready agree, that the first of these methods, as being more simple and less painful, should be preferred to the latter one, if it were equally sure of succeeding. But it is contended for more certainty in its effect. To accomplish a complete cure, the parts to be united must be maintained in perfect contact, and they have required the necessary attention; and how can we always depend upon a bandage for keeping them from being displaced? What other means, besides a suture, affords in this respect perfect security?

I shall first describe the operation as usually done by surgeons of the present day with the treated suture. The first thing is to enquire whether there is any adhesion of the lip to the gum; and if there be, to divide it with a knife. Some authors (Sharp) recommend the fracture, which attaches closely to the gum, always to be divided; but when the lip is at some distance from this part, it will not be in the way of the operation, and need not be cut. On the other hand, when the fracture is situated in the course of the fissure, it is clear that it operating, we must necessarily divide it in the incision, and if should therefore

be divided beforehand, taking care not to encroach too much upon the gum, but the bloody process be laid bare; nor too much upon the lip, because making it thinned would be disadvantageous to its union.

When one of the lower teeth opposes the fissure, jaws forwards, it must be drawn out, and removed and irritate the parts after they have been brought into contact.

Sometimes, but particularly in cases in which there is a cleft in the lower part of the palate, a portion of the or maxillary superior forces such a projection, and in the situation of the fissure in the lip, that it would render the union very difficult, if not impossible. In this case, however, the common plan has been to cut off the projecting angles of bone with a strong pair of bone-nippers. The part was then healed, and the operation for the hare-lip performed. Instead of cutting off the projection of bone, which is always a painful measure, I have tried to employ simple compression, by which means the projection was usually reduced in a few weeks, and the opportunity afforded of operating for the cure of the fissure in the lip (see Clin. par. Rollat, t. 2, p. 307). Of course, the actual necessity of using bone-nippers, or even of having recourse to compression of the bony projection, will depend upon circumstances; for if the prominence of bone be sharp and angular, no surgeon, I conceive, would hesitate about the removal of such irregularities of the surface to the end of cure. Mr. Davis, of Edinburgh, has expressed to me his doubts whether cutting off the prominence of the alveolar process be ever necessary, in the treatment of the cleft lip gradually dissolving, the deformity. "I had thought two very eminently cases, without taking any division of the palate, together with a projection of the alveolar process, which, with the incision made, resembled the lip of a hare." A subsequent appearance of this very typical lip, bone of the nose. In drawing the teeth in the first case very delicately, I avoided fracturing the bony process. Then cut off one edge of the bony appearance, and of the lip on the same side, and attached them together with two threads. The wound was judiciously treated in a week or ten days to allow the second operation on the other side. In one of the three weeks the boy was sent home quite well. In the attendance of the neighbourhood, where his beautiful appearance had made him an object of disgust and ridicule. I succeeded in the other case even without the extraction of the teeth. Both the patients can now articulate like other people, retain their nativity, and are probably losing the inconvenience of the passage of the saliva from the nose into the mouth, as the fissure is more contracted, and the projection by no means so disagreeable." These cases should induce the hands with which certain operations succeed in cutting away projection of the alveolar process; for a moderate protrusion of bone without any sharp, irritating edges or angles, will not hinder the success of the operation; and even the property of removing teeth may entirely depend upon their being truly, by their direction, to irritate the lip, and destroy the union of the fissure.

One serious objection to trying the projection of the part is the deformity afterwards likely to continue during the time the deformity of the alveolar teeth; and another is, the subsequent overlapping of the lower jaw, and its projection beyond the upper one; corresponding to the mouth an appearance seen in very old subjects. These were the considerations which induced me, in the case above mentioned, to employ pressure, which is much more judiciously applied by means of a kind of spring-band, adapted to the shape of the lip, and with bandages, which would be seriously prejudicial, and the right action of which could not be resisted without the utmost difficulty. When the bone of the lower jaw be cut away, an attempt at its readjustment and angular position, I advise the practitioner to remove only the irritating parts, and afterward leave nature to possess.

In the operation, the great object is to make the mouth and even a cut as possible, in order that it may more readily unite by the lips intention, and of such a shape that the nostrils may form only one narrow slit. The edges of the fissure should, therefore, never be cut off with scissors, which constantly divide the tissue which they divide, and a sharp knife is always to be preferred. The best plan is, either to place any dis-instrument, such as a piece of horn, wood, or

nearest commissure, a rounded red substance is necessarily situated, which is so absolutely necessary to its life in the suture. Were this neglected, the tissue below would be exposed, and, through an impudic economy, a degree of deformity would result. The great error, however, is to make the two incisions diverge at an acute angle, so that the edges may be put into reciprocal contact their whole length, without the least difficulty.

M. Lonsie used to operate as follows:—the patient being seated in a good chair, his head is to be supported on an assistant's hand, who with the fingers of both hands presses the cheeks forward, in order to bring the edges of the fissure near to each other. These are to be tied on a piece of parchment, which is to be put between the jaw and lip, and be as thick and a half long, then twice to three lines broad, and not more than line thick. The upper lip should be stretched by fastening the surgical handle to facilitate the incision, the lip is to be stretched over the parchment, the operator, holding one person over the right with the thumb and index finger of the left hand, while the assistant does the same thing on the left side. Thence being thus disposed, the edges of the fissure are to be cut off with two strokes of the bistoury, in two oblique lines, forming an acute angle under the fissure.

For the removal of the edges of the hare-lip, surgeons have variously been prevailed to a knife; but notwithstanding Dondett's jealousy so there, as most convenient (see *Quart. Rev. Med. & Surg.* 1796, p. 176), they are now very generally discarded. The paring and breaking which result from the action of the two blades are circumstances which cannot be favourable to the union of the wound; and though they are not necessarily to be recommended to prevent union by the first intention, they are so commonly tried, with dry after treatment, or under the influence of error. Let our practitioners have been led by Mr. B. Deffenham, that he was terrified by cut of one side of the fissure with a knife, and the other with scissors; that the latter cut produced no pain, and that on this side there was no more exciting inflammation than on the opposite ear.

The pins should be introduced at least two or three of the way through the substance of the lip, four or five should make up the rest of the part, which might prove troublesome by drawing pieces of food so long as it. There is, however, a stronger reason for attending to this circumstance, viz. the hemorrhage which may take place when it is neglected. As soon as the edges of the wound have been brought together by means of the suture, and the pins are properly placed, the bleeding almost always ceases; but when the pins have not been introduced deeply enough, and the posterior surfaces of the incisions are not applied to each other, the blood may continue to run past the mouth, and give the surgeon an immense deal of trouble. In the present method by Lonsie there is a case in which the patient died in consequence of such an accident. Persons who had undergone the operation were always advised to swallow their spittle, even though mixed with blood, in order to avoid disturbing the wound by getting rid of its effluvia. In the case alluded to, the patient, who had been operated upon for a sanguine affection of the lip, swallowed the blood as he had been directed to do, and he died so profusely that he died. On the examination of the body, the stomach and small intestines were found full of blood. "This desperate case," says the illustrious author who relates it, "deserves to be recorded for public instruction, for the purpose of keeping alive the attention of surgeons on all sanguine affections, as consequences of any operation whatever, there is no means so apparent bleeding in the cavity of the mouth. Further is the worthy writer tells, as he and I have, become thick and of danger. The bleeding from the edges of the wound stops of their days but as soon as they have been brought into contact and stretched together by our care, we must be taken that the vessel does not swallow the blood, which would make him vomit, or even swallow him. Hence, his head should be elevated that the blood may escape externally, a pretension more particularly necessary in young children."

Having described the mode of operation by the hare-lip as approved of by the majority of practitioners, and retained every thing which seemed unusual, I have now only to explain the method accepted by M. Lonsie. His

sentiments respecting several particular points of the operation have been already stated; and an account of the means which he employed in lieu of the twisted suture, for making the edges of the wound, is all that remains to be noticed.

Several bandages for supporting the raw portions of the divided lip, and keeping the pinholes which they make against the pins, have been mentioned by authors. Ponsie and Deffenham, in particular, describe two kinds. Three months were not only employed as auxiliary, but even sometimes as curative ones, when it was impossible to use neither. To each bandage, two compartments are too convenient in their effect, M. Lonsie prefers a simple linen roller, one inch wide, three or four long, and rolled up into two or three folds. He begins with applying the body of this bandage to the inside of the fissure; he supports the two heads from before backwards, above, below, between the upper part of the bandage and the incisions, in order to let them cross on the nose of the nose, and then pass downwards again. The assistant who supports the head, and pushes downwards the cheeks, must lift up the ends of his fingers at the place of which, on each side, a small portion is to be put. This being covered, and pushed from behind thoroughly the roller, will constantly perform the office of the assistant's fingers, who is to continue to support the apparatus until it is all completely applied. The longest of the two heads of the roller being six or seven inches over the lip, proceeds two parallel spaces; the foremost of the shortest one is divided into two parts, as far as the end. The two little narrow bands in which a transverse piece then passes through the openings of the former, and cross upon the middle of the lip. The ends of the roller being carried from behind backwards, are then to be applied to cross each on the nose of the nose, where the shortest is to be. The remainder of the band is to be employed in making turns round the head. This bandage may be still more readily fixed by means of a piece of tape, which is to pass the forehead over the upper fissure, and be passed at each end to the intercommissures of the upper; while a second piece of tape is to cross the first one at the top of the head, and also to be attached to its extremity to the middle bandage, and the compresses placed under the typical motion, for the purpose of pushing forward the cheeks.

This bandage is extremely simple, and would answer well as an auxiliary to the twisted suture. I think this last, means well always to be the favourite of the practical surgeon, because the desired effect can be produced by a with much less trouble than must be made with the bandage, in order to render the operation of the latter sufficiently certain. Besides, as I have noticed, M. Lonsie himself mostly made one stick over the red part of the lip, so that he cannot be said to have trusted altogether to the bandage.

What has been said respecting the operation for the hare-lip, is equally applicable, not only to the treatment of cancer of the lip, but also to that of aneurysm, carbuncles, or lacrimations of this part, from any cause whatsoever. We shall only remark, that in a recent wound, all the surgeon has to do, is to apply the twisted suture and adhesive plaster without delay.

When there is a fissure in the lower border of the roof of the mouth, it slowly diminishes, and gradually closes, after the hare-lip is cured. But this does not always happen, and when the parts remain so considerably separated as to obstruct speech and deglutition, or cause any other inconvenience, a plate of gold or silver, exactly adapted to the arch of the palate, and secured by means of a piece of surgical bandage at its corners, and introduced into the flesh, may sometimes be readily employed. When the opening is of considerable size and very dry before, being tied, the moisture of the adjacent parts will make it speedily, and in many cases be sufficient to keep it in its situation, so as readily to facilitate speaking and swallowing. Nevertheless, however, the fissure is so shaped that the tongue cannot be fixed in it: this frequently happens when the opening makes very much towards the front of the jaw. In such cases, it has been proposed to fix a plate of gold by means of openings covered with the same material. Plaster, which is cheaper, might be used for the same purpose. The subject, however, of artificial plates is one in which much mechanical ingenuity may be usefully exerted, and it can hardly be supposed that I should have so more than five or six

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The operation of nephrectomy, or pelvic exstrophy was first performed in 1894, by Professor Wadsworth, of India, and soon afterward repeated in Paris by M. Tonn.

Professor Wardner, of Harvard University, was the first to perform it in this country, and Professor Florence, of New-York, has since repeated it on a young man, *et. 55*, for a frightful congenital disease of the palate, with very unfavourable success. This latter case is reported at length in the New-York Medical and Surgical Journal, for April, 1827.—(Root.)

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HEAD, VENTRALS, WRIST. From the capacity of parts of which the body is composed, than their structure, resistance, and uses, inferences draw as to its potential endurance feasible of much more significance than the same kind of life can prove, when inferences the only most legitimate of the role of the body. One principal notion of the finger in these cases depends upon the free communication between the vessels of the pericardium and those of the dura mater, through the spine of the skull; for when interference is killed in the lower membrane, it may extend itself to the latter. According to Sir Astley Cooper, there are three vessels in which vessels of the body may induce fatal compression: 1st, by producing what is called an aneurysmal inflammation to the head; 2dly, by producing aneurysmal expansion under the tendons of the vertebral arteries; 3dly, by rendering a single fracture compound, so as to cause more extensive inflammation of the third matter.—*Lectures*, vol. 1, p. 293. The latter observation, as far as my intimate acquaintance is concerned, deserves the serious consideration of the practitioner; for in the great hospital where I was educated, and in all the practices which I have seen in the army and navy, as in biology of this kind was ever supposed between ordinary compound fractures and those of the cranium. If the doctrine be correct, it seems another weighty argument

against the method of cutting down to a fracture of the limb without benefit thereby.

These records of the early life, infancy, and adult years continued to increase, owing to friends and acquaintances; but they are not entirely devoid of danger, in proof of which, Sir Astley Cooper mentions the case of a lady of rank in the country who had from the removal of an exposed tumour of the scalp—(Gazette, vol. i., p. 260.) Finding over these cases, however, were generally lost as well the generality of cuts in the skin of other parts of the body, and perhaps in some cases of treatment, Mr. Pott proceeds to mention a numerous and assorted wounds. "The arms may be subject to two kinds, viz. those in which the laceration, though more or less deeply divided, still keeps in some one situation, and is not supposed nor required to be exposed to any considerable distance beyond the borders of the wound, and those in which it is more severely divided from the parts it ought to cover. The arms of this, if simple, and not combined with the symptoms or appearances of any other accident, does not require any particular or different treatment from what the same kind of wounds require on all other parts;" but with respect to those in which the wound is separated and detached from the parts it ought to cover, Mr. Pott makes no attempt of pointing to his opinion, that its protraction might always be interrupted, unless it be so open as to be immediately closed, or there are manifest general symptoms of ill success; in former days, the practice of the incision and detached scalp was the general practice; but Mr. Pott had so often made the experience of attempting to preserve the skin piece, and in this manner, that he recommended it as a thing always to be attempted, even though a part of the cranium were exposed here.

Here I may remark that all governments are not badly served by getting away the study, even in the circumstances, in which such premises were entered in. For, by so doing, the student writer will not be exposed to any necessity to study the same. However, as it is impossible for him to take the course of his study, which never can be with certainty fixed; and as the execution of the part is possible, the production of the board, even if something must follow, such operations as, in every point of view, would be wrong. With respect to other matters, it is true, the execution of the same, and even the application of the principle, never require any of the study to be set aside. (See *See* *See*.)

Notwithstanding Mr. Post asserts that the majority of farmers for raising certain important breeds of the sheep, the best practitioners of the process, do generally employ only stocking plow. Sometimes the loosened sump will surge with the plow, from which it is then and sometimes, and there will be no other loss than what arises from the disarrangement of breaking the top of the mound into smooth and continuous contact, the sort of which can most be made in practice. Sometimes such perfect reason is not to be attained, in which case, matter will be forced and collected in those places where the plow is not used; but this does not necessarily make any difference in the general intention as to the event, that matter may easily be discharged by one or two fresh openings made with a harrow; the land will be greatly improved, the natural contour; and the same will be very soon corrected by a few hard seasons.

In some cases (see Post should be described in whole unoccupied place will make perfectly, and give little or no trouble, especially in young and healthy persons. In some, the uterus will take place in some parts and not in others (see Brode, in *Ann. N.Y. Hosp.*, vol. 14, p. 385); and consequently there will be found, and require to be discharged, perhaps in several different parts, and in some particular conditions, and habits, there will be no need at all. The fact of the uterus in the early stages will induce and become strongly, a pathological quantity of matter will be collected, and, perhaps, the uterus will be decided. But even in the case of this, which does not very often happen, where the uterus is found, and in almost the same, which has been the case of more simple leucorrhoea and endometritis.

If the surgeon will not be too soon or too much alarmed, not in a hurry to cut, he will often find the case much more favorable than he may at first imagine: let him take care to keep the inflammation under by proper means, let him give passage to the matter as freely and fully formed, and the sloughs perfectly separated, and when this is accomplished, let him make a proper use of dependent openings for the discharge of them, and let him by bandage and other proper management, keep the parts in constant contact with each other, and he will often find, that although he was told in his first opinion of procuring immediate union, yet he will frequently succeed in this his second: he will yet save the scalp, shorten the cure, and prevent the great deformity attendant (particularly in women) not only from the scalp, but from the total loss of hair.

This union may often be procured, even though the infection should have been perfectly absorbed by the accident; and it is true, not only though it should have been stopped at its perichondrium at first (see *abscesses in the forehead of the head*, case vi), but even if that perichondrium should have become sloughy and cast off, as Mr. Pott has often seen.

Excitation from a fracture, laid bare by external wounds, and to which no other agency has been done than merely stripping it of its covering, is a circumstance (see *Pott*) which would not so often happen if it was not taken for granted that it must be, and the bone treated according to such supposition. The soft parts, instead of the bones of children and young people will frequently furnish an instrument, which will cover their surface, and under explanation give opportunity (see also *fracture*, in *Med. Chir. Trans.* vol. II, p. 409); and even in those of mature age, and in whom the bones are still harder, excitation is not so often the effect of art as the absorption of matter, and produced by a method of dressing not suited to accomplish such end, and a large proportion of it being necessary. Sometimes, indeed, it happens that a small scale will necessarily separate, and the case cannot be perfectly healed till such separation has been made; but this kind of excitation will be very usual and then in proportion to that produced by art, that is, that produced by dressing the surface of the bone bare with spirituous functions, &c.

Small wounds, that is, such as are made by instruments or bodies which pierce or puncture rather than cut, are in general more apt to become inflamed and to give trouble than those which are larger; and in this part particularly, are sometimes attended with so high inflammation, and with such symptoms, as alarm both patient and surgeon.

If the wound affects the cellular membrane only, and has not reached the aponeurosis or perichondrium, the inflammation and tumor affect the whole head and face, the skin of which wears a yellowish cast, and is sometimes thickened with small bladders, containing the same colored serum; it reserves the impetuosity of the pulse, and becomes pale for a moment, but returns immediately to its inflamed colour; it is not very painful to the touch, and the eyes and ears are always suspended in the tumefaction, the fever of which is sometimes so distended as to be attended with a feverish heat and third generally accompany it; the patient is restless, has a quick pulse, and most commonly a nausea and inclination to vomit.

This disease generally happens to persons of intense habit, and is indeed an inflammation of the erysipelas kind; it is sometimes alarming to look at, but is run often attended with danger. The wound does indeed receive look well, and exude a healthy discharge, while the fever continues, but still it has nothing threatening in its appearance, none of that look which bespeaks a mortal result; the scalp continues to adhere freely to the skull, and the patient does not complain of that oppressive pain, nor is he afflicted with that burning tenderness which generally attends acute inflammation of the brain.

Phlebotomy, leeches, purges, and the use of the common antiphlogistic medicines, particularly those of the neutral kind, generally remove it in a short time. When the inflammation is gone off, it leaves on the skin for a little while a yellowish tinge and a dry scurf, and, upon the disappearance of the disease, the wound transparently recovers a healthy aspect, and soon bestows some very distinct trouble. I do not remember yet the

exhibition of bark, in this form of erysipelas, as ever productive of any decided benefit.

Wounds and contusions of the head, which affect the brain and its membranes, are also subject to an erysipelas kind of swelling and inflammation; but it is very different both in its character and consequences from the preceding.

In this (which is one of the effects of inflammation of the meninges), the local symptoms are much higher, the pulse harder and more frequent, the anxiety and restlessness extremely troubling, the pain in the head excessive; and in this kind of appearance, in these circumstances, most frequently the immediate precursor of matter forming between the brain and dura mater, it is generally attended with irregular convulsions, which are not followed by a critical crisis, nor afford any relief to the patient. To which it may be added, that in the former case the erysipelas generally appears within the first three or four days; whereas, in the latter, it seldom comes on till several days after the accident, when the symptomatic fever is got to some height. In the simple erysipelas, although the wound is crude and unhealed, yet it has no other mark of mischief; the perichondrium adheres firmly to the skull, and upon the cessation of the fever, all appearance becomes immediately favourable. In that which accompanies injury done to the dura mater, the wound has only a spongy, glazed, unhealthy aspect, but the perforations in its neighbourhood separate spontaneously from the bone, and quite all cohesion with it. As death, even in an accident proceeding from a laceration of the skull, and not indicating any mischief beyond itself, the latter is a symptom or a part of a disease, which is occasioned by injury done to the membrane of the brain: one part only is killed to the point, and almost always ends well; the other implies great hazard, and most generally ends fatally. It is therefore hardly necessary to say, that it behoves every practitioner to be careful in distinguishing these from each other.

If the wound be a small one, and has passed through the cellular membrane to the aponeurosis and perichondrium, it is sometimes attended with very dangerous, and even very alarming symptoms, but which now look a different case, and are very distinguishable from what has been just mentioned.

In this, the inflamed scalp does not rise into that degree of tumefaction as in the erysipelas, neither does it pit, or retain the depression of the finger on an elevation. It is of a deep red colour, marked with the yellow tinge of the erysipelas; it appears tense, and is extremely painful to the touch: so it is not an adhesion of the cellular membrane, and as the bone and the erysipelas are not covered by the parts in which the wound is indicated, they are seldom if ever comprehended in the tumour, though they may partake of the general inflammation of the skin; it is generally attended with acute pain in the head, and such a degree of fever as prevents sleep, and sometimes brings on a delirium.

A patient in these circumstances will often more feel excruciations by phlebotomy than one following upon an erysipelas: the use of warm fomentation is required in both, in order to keep the skin clean and perspirable; but as emollient cataplasms, which is generally advised in the former, may in this latter case be good with great advantage.

When the symptoms are not very pressing, see the best very inflammatory method will prove sufficient; but it sometimes happens that the scalp is so tight, the pain so great, and the symptomatic fever so high, that by waiting for the slow effect of such means, the patient runs a risk from the continuance of the fever, or else the increased aponeurosis and perichondrium, becoming sloughy, produce an abscess, and involve the eye both before and afterwards. A division of the wounded part by a sharp instrument down to the bone, about half an inch or an inch in length, will most constantly remove all the bad symptoms, and, if it be done in time, will render every thing else unnecessary. We have perceived that, in this form of inflammation, the practice of making an incision had the sanction of Pott; but the extent of the wound recommended is moderate, and very different from what has been recently proposed for dangerous erysipelas of the scalp. With respect to the good effects of such an incision Dr. Keil considers this greatly exaggerated.

gerated by anæmia; and while he admits that they are useful when the inflammation extends under the aponeurosis, he is not inclined to estimate it as a right proceeding in other instances.—(*See Clin. Lect. on the Brain*, p. 8.)

Thus Mr. Pott was of opinion, that the difference of the symptoms in the temporary cases depended upon whether the wound only affected the skin and cellular membrane or penetrated more deeply to the aponeurosis and pericranium; a doctrine which has been justly regarded as questionable. With respect to the observation that it is a precursor of the aponeurosis swelling, he is confined, within the limits of this tissue, and does not extend to the sinus and eyelids; it is a symptom which Desault thought arose rather from superficial inflammation than the observation of writers. The doctrine, indeed, must appear doubtful, when it is considered, 1st, That the aponeurosis and pericranium are parts of scarcely any sensibility. 2dly, That the opinion had the origin at a period when these parts were supposed to be highly sensible. 3dly, That in other parts of the body, a wound in which a flaccid or the pericranium is wounded is rarely attended with the above-described severe symptoms. 4thly, That now the wounds which affect only the skin and cellular membrane, and yet these symptoms occur even with a pleuro-pneumonia thoracis. 5thly, On the contrary, in other instances, in which the aponeurosis and pericranium are undoubtedly wounded, no bad symptoms at all take place. 6thly, These symptoms may almost always be removed by the exhibition of tannic acid anodyne.—(*See Clin. Lect. on Desault*, p. 8.) In the case often named inflammation of the fluids, after bleeding, it is not the fluids itself which is the real and chief seat of the pain, inflammation, &c., but the subjacent cellular membrane and cranium. The theory of Desault is, that the erysipelas infections of the scalp so frequent after injuries of the head, are connected with disorder of the functions of the liver, produced by such accidents. Yet it is difficult to understand why a more profuse of the scalp should cause this disorder of the liver more commonly than the same kind of wound of any other superficial part of the body.

The injuries to which the scalp is liable from contusion, or appearances produced as it by such general causes, may be divided into those in which the mischief is confined merely to the scalp, and those in which other parts are interested.

The former, which only come under our present consideration, are not indeed as numerous, considered absolutely. The latter is rather very readily distinguished, or the extravasated blood causing it is easily got rid of by a small opening. 1. I. First free, and afterward free, particularly noticed this case, on account of an accidental circumstance which somewhat interests it, and renders it likely to be very much mistaken.

When the scalp-membrane is very much lacerated, it often happens that a quantity of extravasated blood, frequently forms a tumour, easily distinguishable from all others, and generally very early cured. But it also sometimes happens, that this kind of tumour proves to the fingers of an unskilled or unfeeling surgeon a sensation so like to that of a fracture, with depression of the cranium, as may be easily mistaken. Now if, upon such supposition, a surgeon needlessly makes an incision into the tumour, so that he give the patient a great deal of unnecessary pain, and for that reason risk some loss of his own character.

The touch is in this case so liable to deception, that surgeons should always be led to other circumstances and symptoms, before an opinion is given.

If a person with such tumour, occasioned by a blow, and attended with such symptoms, and, yet, has any complaint which seems to be the effect of pressure made on the brain or nerves, or of any mischief done in the parts within the cranium, the division of the scalp is often inquired into the state of the skull, is sight and necessary; but if there are no such general symptoms, and the patient is in every respect perfectly tranquil, the best of something like a fracture will not occasion any valuable such operations, since it will often be found that such sensation is a deception, and that, when the extravasated fluid is removed, or dissipated, the tumour is perfectly sound and unaltered.—(Pott.)

With the exception of instances in which the dura mater separates from a blow on the head, and the symptoms are such as to require the trepan, or other operations in which an abundant supply of blood is necessary, in a large quantity of blood is effused in the same manner, none of the cases which have been here mentioned can justify making incisions in the scalp. When blood is superadded under the scalp, the incision need not be too extensive with me, but, as the incision there is a violent electrolytic blood. The remedy with which an effusion of blood under the scalp is disposed as well illustrated in a case mentioned by Mr. Brooke. He was consulted about a young gentleman, under whose scalp an effusion of blood exuded from the superciliary ridges to the top of the head, and from ear to ear. The blood appeared to be in a fluid state, and was so copious, that no part of the cranium could be felt. In a few weeks, and without aid of a cold lotion, the whole tumour was absorbed. Mr. Brooke observes, that whenever high in the vessel required, it must have continued to bleed a considerable time, in order to produce so large an extravasation. I have seen three or four times nearly as remarkable as the preceding, and having a similar favourable termination under the use of simple German Saline and occasional purgatives. In one instance, attended by Mr. Brooke, he succeeded in preventing the effusion from producing the effects described in his last case, by means of pressure applied to the point where the flow had been received, and a vessel tied.—(*See Med. Cas. Trans.* vol. 13, p. 386.)

The utility of an antiseptic lotion, was suggested by Pott to be an inflammation of the aponeurosis is a less questionable, as far as it is done under the idea of merely obtaining rest, without there being any matter to be discharged. Incisions, especially for the purpose of exposing the bone, are only right as a prophylactic step to keep the scalp, when the necessity for the operation is indicated by decided and urgent symptoms of pressure on the brain. Now such pressure, in any of the symptoms above treated of, can only arise from a suppuration under the skull, a subject which we presently have to consider.

Dr. Ferrius, in his truly practical work, has very properly advised surgeons not to be content with opening away a little of the bone around the injury, but always to divide the bone down to the proper extent. This proceeding, which is perfectly harmless as long as it is generally right that the nature of coming the scalp, which has been too frequently employed without any rational aim. The free removal of the hair during which is the most effect of the scalp is a very simple and easy part of the operation, and the hair being removed, the scalp is left in a state of rest, and the pressure will have a more correct notion of the extent of the injury, and the patient than he might otherwise have imagined, and is more strict in his rules of treatment. Now, instead of a dissection of the skull, sometimes we should be very distrustful of the necessity of the trepan, and to escape otherwise, while consulting with the eye, are frequently deceived after its power, and the surgeon being now aware of the extent and situation of the mischief, instead of treating as he is bound to regard the treatment. In short, at Dr. Ferrius has observed, "independent of the more accurate view thus presented, we facilitate the application of trepan, if they may be found necessary, and of a more certain advantage on all occasions, viz., and application."

It affords the possibility of planning as to be able to discover as good a surgeon as Dr. Ferrius, among the advocates of Schuwaloff's plan of letting the head well exposed and covered with cloths that with a very old fellow; a practice which the latter himself, always always adopted, whether a subcutaneous or extracranial injury of the part had the appearance of being within or not. "As soon as the patient was brought to the hospital, with a wound of the head, whether the injury was supposed to be not (says Schuwaloff), I attended the part to be immediately removed, and after the necessary incision, applied dressings. Patients orders of blood were immediately away, and the cranium, in last instance, rejected, according to circumstances, when it fell down within the space of twelve or four hours. The patient now generally became better, and the determination of blood in the head removed. After the pressure and the release of the head, such cases, depend on the cold nature of the matter applied, were less, and more."

every brain. These discharges kept in their place with the lamellae called the great cerebral—(see standard age.) As internal medicines, the nitrates of potassa, neutral salts, and emetics and stimulating diuretics, and gentle aperients were given. These means were employed, both in single injuries and in those where the bones were depressed, and the fissures and fractures were accompanied with rational contractions (twitchings, cramps, paralytic, and other local symptoms), and even in cases where the use of the machine was indispensable, the practice was continued until the case was cured. (See *Chir. Hæmorrhæmages*, 3, l. p. 124.)

Ichterus was led to try this practice in the great breadth which he had seen afforded by the application of cold water to the head in cases of trauma, attended with great distension of blood in the brain. And in order to increase the efficacy of the water, he added to every five gallons of a two quarts of vinegar, six ounces of ether, and eight of the mixture of ammonia. This mixture was then presented for use in a cold place—(Vol. vi. p. 113.) Or, in order to avoid ourselves fully of the frigorific effects of this mixture, it should be prepared, as Dr. Hunter observes, in small quantities, and used immediately before use; or, as temperature has risen; or, if it should be applied in a warmer place, it should be applied in a half filled bladder, or other empty dipped in cold water, will often answer every purpose—(See *Military Surgery*, p. 223, ed. 2.) Dr. Hunter mentions one important fact, in consequence of cold applications, antiseptics, and saline purgatives, preceded by the common blood pill, and assisted with quiet and abstinence. viz. by such means, "these troublesome puffiness, enlargements and erysipelas of the face of the scalp, which are often noticed in trauma, are prevented, and where the erysipelas plan is duly observed, the extensive and formidable erysipelas of the face, as common formerly, are rare and seldom as frequent in military hospitals."

5. Effects of Contusion on the Dura Mater and Pons within the Skull.

In contusion of bones, lacerations, and other shocks, either blood may be effused under the membrane, or is disseminated and suppuration of the dura mater may arise. The best description of the latter case is that delivered by Mr. Pott.

Brain and severe strokes on the middle part of the brain, with delirium were the victims, he says, are most frequently followed by this kind of mischief: the cause of the skull wound, which strains the injury, rupture and hemorrhage, and in consequence of such interruption, there the performance separates from the outside of the part of the bone which covers the brain, and the dura mater from the inside, the latter of which immediately, some after, such inflammation, becomes bloody and, and sometimes matter, which is rather long in coming because the said membrane and the cranium, not having an external coat, referring to escape as he described, brings on a train of very terrible symptoms, and in very frequent cause of destruction. The effect of this kind of mischief is frequently noticed in the vessels remaining the dura mater to the cranium, in which much matter is retained in the said membrane; but sometimes the matter forces its consequence of such violence in front on the surface of the brain, or between the patient and matter, as well as on the surface of the latter; or, perhaps, in all these three situations at the same time.

The difference of this kind of disease from either an extravasation of blood or a contusion of the brain is great and obvious. "All the symptoms produced by extravasation are such as proceed from pressure upon the brain and vessels, and obstruction to the circulation of the blood through the brain; stupor, loss of sense and voluntary motion, insensibility and incoherence of sense and respiration, &c., and which lose importance in remark; if the effusion be of any considerable, these symptoms appear immediately, or very soon after the accident."

The symptoms attending an inflamed or bloody state of the membrane, in consequence of external violence, are very different; they are all of the hectic kind, and never at first imply any treatment peculiar to such

any pain in the head, restlessness, want of sleep, frequent and hard pulse, hot and dry skin, flushed countenance, inflamed eyes, bowels, vomiting, rigor; and, towards the end, convulsions and delirium. "And none of these appear at first, that is, immediately after the accident; children could come days are passed."

Thus the observation, made by Pott, is one that is well worthy of the practitioner's constant recollection, just as verily, every his patient secure the worst, and suggest the very use of the only means by which a recovery can be effected. Thus, as for Albert Cooper asserts, the time when inflammation of the brain first, it may be said, of the membrane follows the violence is generally about a week, rarely sooner. "Frequently it does not come on till a fortnight or three weeks after the injury; and even more time sometimes before the patient is quite well, or ought to deviate from a strict and temperate regimen. In confirmation of this remark, a case is mentioned, where the subject to keep the forehead began brought on a fatal attack of inflammation of the brain, as late as four months after the receipt of a blow in the head—(See *Chir. Hæmorrhæmages*, 3, l. p. 124.)

One set of cases of symptoms is produced by an extravasation of blood, making pressure on the brain and origin of the nerves, so as to impair or abolish voluntary motion and the senses; the other is caused by the inflammation of the state of the membrane covering the brain, and seldom affects the organs of sense, and the latter end of the disease, that is, when a considerable quantity of matter is formed, which matter must prove like any other kind.

If there be neither fracture nor fracture of the skull, nor extravasation of blood immediately under the skull, and the only to further consideration, if the wound, the mischief is seldom discovered or attended to for some few days. The first attack is generally by pain in the part which received the blow. This pain, though beginning in that point, is soon extended all over the head, and is attended with a lagging, or disposition of strength and spirit, which are soon followed by a sense and insensibility to voice, a vertigo or giddiness, a gait and fixed pulse, and in propensity of sleeping, at least quietly. A day or two after this attack, if no means preventive of inflammation are used, the part affected generally swells, and becomes puff and tender, but not painful; neither does the matter arise to any considerable height, nor spread to any great extent; if this kind of part of the scalp be then divided, the performance will be found of a darkish hue, and either glass detached or very easily separated from the skull, between which and it will be found a small quantity of dark-colored blood.

If the disorder has made such progress that the part affected is quite separated and detached from the skull, the latter will even now be found to be somewhat elevated in color from around, healthy bone.

Thus this case the symptoms generally increase gradually and more apparently; the fever increases, the skin becomes hot, the pulse quicker and harder, the sleep more disturbed, the countenance and countenance more fuliginous; and to these are generally added irregularities, which are not followed by any critical event, and which, instead of relieving the patient, and consequently is not relieving. If the scalp has not been divided or removed, and the symptoms are thus advanced, the alteration of the color of the bone will be found to be more remarkable; it will be found to be white and red, dry than a healthy skin, or, as Pott says, has very little color; it will be found to be more like a dead bone: the surface of the skull between it and the perforation will also, in the same time, be found to be more of a healthy, and the said membrane will have a more thin, depressed aspect.

In this state of matters, if the dura mater is divided, it will be found to be detached from the inside of the cranium, to have lost its bright surface, and to be, as it were, covered over with a kind of matter, or with matter, but not with blood. Every body after this point, all the symptoms are increased, and become more violent; the strength decreases, the eyes are more frequent, and at last convulsive motions, attended as these with delirium, at others with paroxysms of extreme stupor, finish the tragedy.

If the scalp has not been divided all this part of time, and it is to come later, a very different appearance of the skull will be found lying on the bare cranium.

whose appearance will be still more unlike to the healthy natural one; if the loss be now performed, matter will be found between it and the dura mater, generally in considerable quantity, but different in different cases and circumstances. Sometimes it will be in great abundance, and diffused over a very large part of the membrane; and sometimes the quantity will be less, and consequently the space which it occupies smaller. Sometimes it lies only on the outer surface of the dura mater; and sometimes it is between it and the piamater, or also even in the substance of the brain, or within the substance of it, &c.

As the inflammation and separation of the dura mater is an immediate consequence of the violence, so neither are the symptoms immediate, although some days have passed, the fever at first is slight, but increases gradually; as the inflammation becomes more and more diminished, all the febrile symptoms are diminished; the formation of matter diminishes, rigors, tremors and tremors, with which it usually is collected in large abscesses, diminish, and lastly, the patient recovers.

When the scalp has been wounded, Mr. Pott observes, the wound will for some time have the same appearance as a mere simple wound of the part, attended with other disordered, most likely, it will, like this, at first discharge in this nature or glossy and then begin to suppurate; it will discharge, begin to suppurate, and last perfectly well; but after a few days, as these febrile symptoms will increase; the wound will lose its first corruption and granulated surface; it will become very glossy and bloody; instead of good matter, it will discharge only a thin discoloured serum; the film with which it is dressed, instead of coming off easily (as in a healthy suppurating sore), will stick to all parts of it; and the perforations instead of adhering firmly to the bone, will separate from it, it will recede at some distance from the edge.

"This situation in the face and countenance of the face is produced partly by the diseased state of the parts underneath the skull; which is a continuation of the inflammation in support of the diseased skull, and is characteristically proved, by observing that this diseased aspect of the face and countenance, separation of the perforations, the always confined to the part which causes the altered or injured position of the dissection, and which at all affect all part of the scalp; say, if it has by accident been wounded at any other part, or a portion has been removed from any part where an injury has been done to the dura mater, or such separation will happen, the detachment above said always correspond to this below, and be found to where it is.

The first appearance of alteration in the wound immediately depends on the febrile attack; and as the febrile symptoms subside, the more becomes white and more; that is, digestive matter and more from a healthy, healthy aspect.

Through the whole time from the first attack of the fever to the last and fatal period, an attentive observer will remark the gradual alterations of the colour of the face, if it be fair. At first, it will be found to be white and more dry than the natural one; and as the symptoms increase, and either matter is collected on the dura mater becomes bloody, the face becomes more and more to a kind of purple, like or white as yellow; and it may also be white while in this place is found, that if the face was on or very hot in a patient, and the patient young, the heat will be offensive to the air, it may be so to let through a loose, yellow, ill-natured fungus; at which time, also, a great increase in the patient's heat and flow is attended with an erysipelas.

In these cases in which the scalp is very little injured in the brain, and in which there is no wound, but any immediate striking symptoms of suppuration, the patient will have no such symptoms, although matter may suppurate, with some few days are past. At the end of the symptoms, then, he is generally attacked by the symptoms already treated; these are not growing of first, but they may increase so with a degree, so as to kill the patient, where, where it will not, but when this is the case, the patient frequently suffers from what we call a first indication of matter, and prevents with attempts being made, and such attempts being taken of him, as might prevent the formation of matter.

But if the symptoms are so increased as to cause or claim our early regard, very useful information may from thence be collected, for whether the scalp be con-

siderably injured, or whether it be found necessary to divide it for the discharge of extravasated blood, or if necessary of some suppuration or more violent symptoms, the state of the perforations may be thereby ascertained and more certainly known; if in the place of such better, the perforations be found spontaneously detached from the skull, having a quantity of discoloured serum between them under the tanned part, in the manner already mentioned, it may be regarded as a very certain indication, either that the dura mater is beginning to separate in the more interior, or that, if some perforations be not immediately used, it will not suffer; that is, it will inflame, separate from the skull and give room for a collection of matter between them. And with regard to the wound itself, whether it is situated at the base of the cranium, or elsewhere generally, it is the same thing; if the situation of it is superficial, or is found, if the signs of it immediately give their influence to the bone, and the febrile symptoms are at the same time making their attack, these circumstances will serve to convey the same information, and to prove the same thing.

The particular effect of continued suppuration and its effect on the brain, and on the general health, is not to be considered, as well as an extravasation of blood, in cases where the bone is more, and, in some other kind, at these do either by the nature of the connection of the individual matter. All this is matter of observation, and the other circumstances, we will not omit, the symptoms of separation of the dura mater, in consequence of a severe blow, or other causes, is attended by a separation between the cranium and the matter, a circumstance extremely well worth attending to at distinct and unexpressed fracture of the skull, because it is from this circumstance, probably, that the fatal symptoms and the patient in such cases arise.

It is a very common thing for a patient to be brought to bed to produce some disturbance and symptoms which after a short space of time disappear, and the patient perfectly well. A slight pain in the head, a little swelling of the face, a vertigo and nausea, sometimes immediately follow such a wound, but it is not common many hours, especially if any treatment has been used. There are not uncommonly some to a light continuation of the fever, which having suffered no material injury thereby, soon ceases. But if after an interval of some time, the same symptoms are renewed, if the patient, having been left, becomes more feverish and restless, and that ending in not passing; if he complains of being hungry and vomits, sleeps disturbedly, loses his appetite, has a hot skin, a hard, quick pulse, and a flushed, heated countenance, and a further irregularity of his countenance, and has been productive of these, the prognosis must certainly be alarming, and that most probably under the skull.

If the symptoms of pressure, such as vomiting and of some, watery matter, for, after some time after the head has suffered injury the patient will have the head so much probably supply an effusion of a fluid somewhere; this effusion may be in the substance of the brain, in its ventricles between its membranes, or in the volume of the membranes, and which of these is the real situation of such extravasation it is matter of great uncertainty, none of them being attended with any peculiar mark or sign, and one may be proved upon as pointing it out precisely, but the examination of the dura mater, and the situation of matter between it and the skull, in consequence of corruption, is generally supposed to be the best way. Mr. Pott has happily been known to find a large, irregular, indurated tumour of the dura mater, a spontaneous separation of the perforations from the skull, and such a patient.

These appearances, therefore, following a blow on the head, and attended with nausea, vomiting, weakness, quick pulse, fever, and slight, irregular shivering, do almost certainly indicate an effused very gross, and yet either forming or formed between it and the cranium.

By detachment of the perforations in the skull, every separation of it from the bone which it should cover. It may be, and often is, red, hot, it is moved off, without any such consequence; the same appearances are violent; whereas that which Mr. Pott calls is appearance, and is produced by the destruction of these vessels to which a new connection with the skull, and by which the communication between a pit

showing the largeness of the ball, till it could be seen internally, and the aperture through which it had passed was not more than twice its size. The brain was every where in contact with the skull, and was everywhere equally compressed. The patient experienced a painful sense of oppression and weight in the head, and, when he inclined his head backwards, was seized with giddiness. The legs were weak tremulously in a strong current with out being on his knees. Larry said that every symptom of compression of the brain was present, though the operation is rather difficult to comprehend, considering that the patient stood up, and almost his posture. As we are the surgeon given by himself of his confidence, that in another circumstance in which I should not be permitted to dwell because it is all violating the honor was not able to interfere in the Russian language, and the operations respecting the skull's surface were made in some other way. The following might be the real state of the symptoms: said in a case of this kind a correct account of them would have been interesting; the ball was plainly contained, by means of a probe, to be of that size of about three inches, and the opening through which it had entered, and that for the purpose of examining it the application of the finger was usually necessary. The fracture was daily brought into view by cutting through the skin, perforations were made with a small hammer in the upper part, and when the removal of the margin of the bone between these perforations the ball, which weighed some three ounces, was easily extracted with the aid of a strong piece of wire and an elevator. A considerable quantity of granulated blood was also brought away when the skull was found with a compression of three or four lines long. As soon as the removal of the bone had been taken away, the part was dressed with a bit of fine linen soaked in warm wine, moistened with sugar, and ointment was placed around, severe compression, and a bandage. With respect to the symptoms of giddiness and other symptoms in the surface of the brain, in which compression or laceration had been, it was not so as to require practice with Larry, or with Schreiner, and the other surgeons. On what principle the causes in all kept up, and whether it was only one or several, are symptoms which were not understood. In whatever way, experience may illustrate these matters, rather it is to add, that the patient was relieved by the treatment, and fell into a quiet sleep for two hours; but in the evening the disease returned, and the work was nearly finished. A considerable quantity of blood was taken from the two apertures and very slowly was not practised at first, some extraordinary. The dressings, which, according to my case, were highly objectionable, were removed, and a large modified poultice applied. Young men, containing a small quantity of tartar emetic, and other antispasmodic medicines were prescribed. The following day the patient's state appeared satisfactory, without the slightest disturbance of the wound, and in the like he perfectly recovered.

The other soldier had been wounded in the left temple with a loaded ball, five days before Larry saw him. The ball of the ball had gone into the cranium through a very narrow breach; the other half broken under the forehead, and had lodged near the posterior pole. The right side of the head was swollen, the wound was unhealed, and the man was in a state of constant agitation. After dressing the wound at the temple, and opening the fracture, Larry discovered the track of the bullet, which had passed through the frontal process, and which he subsequently removed by a craniotomy. At the lower part of the wound, about the middle of the temple, very near the spot where the other portion of the ball was lodged, the whole state of the brain, and a quantity of granulated blood, was easily extracted. The patient, however, was not saved; a hemorrhage, excited by Larry in the operation, having been fatal.

Another case, less often reported, occurred at the hands of the Russians, and with symptoms of depression, not, after death, a picture of a bullet, and a fragment of bone were found under the skull, attended with an internal or external state of the adjacent portion of the brain. Larry very properly expressed his opinion, that this soldier would have had a chance of being saved, had the troops been good.

(See *Med. Repert.* 1814, 4, p. 285, &c.) The practice of trepanning for the removal of balls, situated near a fracture of the skull, within the bony cavity, or lodged among the fragments, or between the two tables filled with matter (see *Encyclopædie de Médecine*, 1814, 4, p. 285, &c.) is not permitted to Larry, for he has been severely injured by other surgeons (see *Mémoires de Médecine*, 1814, 4, p. 285, &c.) but I do not know that he has been attended in his last practice of making a counter-opening in the skull, when the ball is lodged at such a distance from the fracture, as not to be extracted through any perforation made in the vicinity of the original injury. For this a practice which he ventures to try does, that when a ball has entered the cranium, without fracturing the roof of the skull, the case is one requiring the application of the trepan.—*Mémoires de Médecine*, 1814, 4, p. 185. In the 2d vol. of this work (p. 125), the patient with the fracture of a radius, who was struck on the right side of the forehead with a ball, which penetrated the os frontis, and then passed obliquely backwards, between the skull and the dura mater, in the course of the longitudinal suture, so far as the dischordal suture, where it stopped. Larry traced the direction of the ball, by the consideration of an elastic probe, which he used the opening; and measuring the distance between the fracture and the place where he felt the ball, he went down until that part of the skull, beneath which he concluded that the ball was lodged. The bone was then perforated with a large trepan, a good deal of pus was discharged, the ball was extracted, and the patient recovered. One thing here attracts the attention of surgeons: Larry tells us, that a good deal of pus issued as usual as an opening was made in the skull. There were then have been suppurations under the bone, and suppuration and discharge of the dura matter, observations which are not according to fact, by a corresponding supuration in the perforation, and a good quantity of the scalp. This case suggests this place in the forehead, so as to limit the assistance to Larry, in judging of the place where the ball was lodged, and the question of them here carried out by accident, or as we do not, that suppurative may happen between the cranium and dura mater, without any laceration of the pericranium, and justly observe of the scalp, a thing which Richard asserts is proved by daily experience in the House of St. Paul, (see *Chirurgie*, 1814, de Bonnet, 1, 2, p. 29.) Larry, in his 2d vol. (p. 125), says in another case, in which a ball passed the left parietal bone, and lodged near the lambdoid suture. Its situation was detected with the aid of an elastic probe, and pus in consequence of them taking a single copious issue the part. Richard's opinion was made through the scalp, for a small figure discovered. As the symptoms of compression increased, the trepan was applied, so as to remove the bone. A bit of the ball, which was found directly under the perforation, and a good deal of blood was washed from the two openings in the cranium. For a fortnight the case went on favorably; but the patient was then attacked with what Larry terms hospital fever, but which in all probability was inflammation and expropriation of the membrane of the brain, and died.

The necessity of surgery finally increases in proportion to the present liver, or considerable, with balls lodged in the cavity of the cranium. Thus, we are pointed by Parry, where the patient was recovered by means of the trepan, and at the end of six months did so (see *Encyclopædie de Médecine*, 1814, 4, p. 285, &c.). Richard has published another case, where a soldier was shot through the frontal sinus, and the ball was found after death in the medullary substance of the left hemisphere of the brain, half an inch above the ventricle, yet the patient lived three months after the injury, and soon recovered his senses after its removal. For a considerable part of this case he was attended when my father was present. After he was attended with a kind of trepan, and an opening to open his forehead, and fell into a delirium and convulsed state.—(*Schreiner*, *Parry*, 1814, 4, p. 285, &c.) A French soldier, in the battle of Waterloo, was wounded with a musket-ball, which entered at the anterior portion of the squamous suture, lodged in the substance of the brain, and on the fifth day after an enlargement of the wound, and the removal of the

all fragments of bone, was extracted from the posterior lobe of the right hemisphere of the brain, where it was found resting on the arachnoid. Yet during the several previous days, the man, with the exception of a slight headache, and partial destitution of the right extremities to empty perfect health. The case varied well.—(See *Revue Méd. de Paris*, p. 260, vol. 2.) Such more remarkable instances of the duration of life, and even of the absence of any serious symptoms, after great and serious wounds of the brain, and the lodgment of balls, might have led us to; but it will suffice to refer to the instructive history of M. Guigney on the subject, in vol. 1, of the *Mém. de l'Acad. de Chir. Roy.*, and to the account of twenty-two French soldiers, whose wounds, with more or less of the brain, were cut off by surgery. All these men ultimately died; but at first had no a single bad symptom, and performed a quantity of daily labour after being wounded, and one-half of the duration of time.—(See *Papaver, Opuscule de Chir.* p. 41, &c.)

5. Extravasation under its Coverings. Symptoms of Pressure on the Brain, &c.

Mr. Pitt remarks "the shock which the head sometimes receives by falls from a height, by strokes from pointed weapons, &c., does not infrequently excite a lesion in some of the vessels either of the brain or its meninges, and thereby becomes extravasation of the fluid which should circulate through them. This extravasation may be the only complaint produced by the accident; or it may be joined with, or added to, a fracture of the skull. But this is not all; for it may be produced not only when the cranium is perfect, by the blow, but even when no violence of any kind has been offered to or received by the head."

The effused blood may be between the cranium and dura mater; between the latter membrane and the arachnoid; or in the substance of the pia mater, or beneath the arachnoid, or in the substance, or capsule of the brain. The first species of extravasation, which is observed to be always more or less confined, may occur at any part of the skull, but when situated in the brain, is generally fatal. In the second, which is the most common species of extravasation within the dura mater (see *Brain*, in *Art. Chir. Thom.* vol. 14, p. 333), the blood is usually confined about between the dura mater and arachnoid, and on this account, unless its quantity be very considerable, it does not cause any great degree of pressure. In the third example, if the blood be situated in the arachnoid, it is also widely diffused, but it is in the substance or vestibule of the brain, which is rare (*Brain*, vol. 14, p. 333), is circumscribed.—(See *Chir. de Denham*, &c. p. 28.) Sometimes in cases of great violence, as Mr. Pitt has lately observed, the blood is found at the same time in all these different parts.

According to Mr. Brodie's experience, which confirms the observations of Mr. Abernethy, there is longer such extravasation from a rupture of the blood-vessels, by which the dura mater is assumed to be torn, as will produce dangerous pressure on the brain, except when the middle meningeal artery has been lacerated from which vessel the bleeding is sometimes very copious. Mr. Brodie has never seen this after, therefore, except in the circumstances with a fracture running across the bony canal in which it is situated; but he alludes to other cases, recorded by Mr. Latta and Mr. Abernethy, in which no such fracture accompanied the rupture of the vessel.—(See *Art. Chir. Thom.* vol. 14, p. 333.)

Another observation made by Mr. Brodie is, that large extravasations are sometimes found upon the upper surface of the brain, but were frequently at its base, where they are usually the consequence of a rupture of the substance of the brain. This extravasation has never been so extensive, in which the blood does it wounded extravasated between the dura mater and the skull, or between the arachnoid and the brain, as sufficient quantity of fracture with the laceration of the brain.

When the blood is extravasated beneath the skull, the violence which produces the rupture of the vessel usually tears the pia mater, from which state, produced the quantity and pressure of the blood and the force of the respiration to not only grow, but gradually recover and regain its energy. If the first extravasation be

trivial, the patient, after regaining his senses, may only feel a little drowsiness and go to bed. The bleeding from the ruptured blood, continuing, and the pressure on the brain increasing, he becomes more and more insensible, but begins to breathe in a slow, interrupted, convulsive manner. In cases of compression, whether from blood or a depressed portion of the skull, there is a general insensibility; the eyes are half open; the pupils dilated and unresponsive, with loss of the red light of a candle; the action is unsteady; the limbs relaxed; the breathing stertorous; the pulse slow, and, according to Mr. Abernethy, less subject to intermission, than in cases of compression. The amount of convulsive breathing, as this gentleman admits, must not be taken as a proof of their being any compression; the Morgagni's vessels sometimes rupture in persons, in whom the disease was circumscribed, yet no stertor had appeared.

In a part of ventral of the posterior part of the skull, with symptoms, seen by Dr. J. Thomson, the pulse at one time sank as low as 20 strokes in a minute. This eminent publisher, however, is a relation and Mr. Abernethy agree, as to count, by stating that irregularity of the pulse is a frequent effect of any compression of the brain.—(*Report of the Acad.* p. 24, 25.)

Mr. Brodie does not give any positive opinion as to the influence of the pulse in any compression of the brain; but he expresses his belief, that pressure on the brain for the most part affects the action of the heart, not by producing actual obstruction, but by causing its contractions to be either less frequent, or less forcible than natural.—(See *Art. Chir. Thom.* vol. 14, p. 333.) In this opinion referred to in Dr. Thomson's report, some instances undoubtedly arise from the pressure of portions of the skull, forced towards upon the brain. But in a very dangerous instance, but Dr. Thomson gave no other than a few examples after the depressed part of the bone had been elevated, and the extravasation removed.—(P. 34.) Sometimes, I am inclined to regard, with Brodie, rather as a symptom of rupture of the brain, than of compression.—(See *Art. Chir. Thom.* vol. 14, p. 333.)

Mr. Brodie, somewhat in the way of the necessarily partly published in the foregoing work, considers a compressible, whether circumscribed within the capsule, or to be applied as the consequence of a simple pressure on the brain. We had then seen, a very long course of protracted and continued time, when there is no pressure; and whenever he did meet them, he was attracted to depression of the skull, and increased blood, and less afterward had the opportunity of ascertaining the exact nature of the injury, the pressure has always been found to be increased with blood or laceration of the substance of the brain. The compressible substance to which Mr. Brodie alludes, he particularly describes as slight and partial, and different from the more violent and general instances.—(See *Art. Chir. Thom.* vol. 14, p. 333.)

Indeed, the difficulty of the diagnosis in many cases may be well conceived by what Dr. Hennen remarks in his practice; viz. that in some instances the pulse was continued, in others dilated, where the injury was nearly of a similar nature, and again, while sometimes, in the bony part, one part was dilated, and the other much contracted. He saw, also, frequently one on one side, and compression in the other, when the injury had been on the forehead, and the same when it had been on the occiput.—(P. 34, 35, 36.)

Mr. Brodie has seen the pupils dilate with the compression, and contract with the removal of it, though the patient lay in a state of complete insensibility, and did not seem to be at all conscious of the improvement made on the pupil. He admits, however, that this is a rare occurrence, and that, when the other symptoms of pressure are present, the pupils are generally dilated and unresponsive, and much dilated, though sometimes contracted. Every purpose of inspection must be aware of another observation mentioned by the same author; namely, that it is not uncommon for the pupils to remain for a time in a state of contraction, though becoming gradually contracted, and after remaining so for longer or shorter time, to become again dilated; these changes taking place independently of light and darkness. When the pupils have been fixed, Mr. Brodie has frequently known them to become contracted after the abstraction of blood; the diameter

blood is extravasated on the surface of the dura mater, he recommends the blood to be more freely drawn away. He holds this opinion in the case of a vessel which he has opened, where a more liberal opening did not give a sufficient supply of blood to the apparatus that rested on the patient's head. (*Med. Chir. Trans.*, vol. 14, p. 326.)

In the treatment of convulsions from extravasation, Sir Ashley Cooper joins the propriety of symptoms as recommending first depletion, in order to prevent inflammation; the vessels, he says, are to be opened, and the matter kept very quiet. "If there be a tumor, indicating the spot at which the injury has been sustained, you may trepanne with every other vessel has been tried satisfactorily. If a secondary tumor, and the symptoms do not yield to depletion, you will require to seek an explanation." (*Lectures*, p. 228.)

All cases of pressure on the brain are attended with a kind of inflammation of this organ and its coverings. The disease may be viewed as much as possible by applying cold vesicles to the head, and employing fire and repeated bleeding, leeches, cupping, blister, purgatives, and other antiphlogistic means. After the swelling has been controlled, more time should be applied to the head, and the calvaria opened.

Examination of symptoms in this affec-

It is observed by Mr. Ford that "very alarming symptoms, delayed symptoms of the most fatal consequences, are found to attend great vascular disease of the brain; and upon the structure examination both of the living and the dead, cerebral tumors, hemorrhages, or extravasation of any kind can be discovered. The same symptoms, and the same extent, are not found, though the lesion is removed, and injury of all its organs, but has only been violently shaken; nay, when only the basis of convulsion has seemed to have attended the whole patient." And he afterwards remarks, that "the symptoms attending cerebral disease generally in proportion to the extent of violence which the brain itself has sustained, and which, indeed, is explained only by the symptoms. If the convulsion be very great, all power and power of motion are immediately abolished, and death follows soon; but between this degree and that slight convulsion by which the brain is called which attends most fatal disease, there are many stages." But besides the foregoing description of convulsions, which seems to be that is common to a lesion of function, there is another description, the Asphyctic Cooper has found the many, much degrees of it attended with symptoms of the brain, and slight extravasation. (*Lectures*, p. 322.) The latter, however, are rather to be considered as symptoms rather than as evidence of the disease.

Mr. Brodie has observed that the symptoms of convulsions do not depend upon any kind of disturbance of the organization of the brain as evidence of being diseased, or as by dissection; yet he makes the inference but justified, that there is really no organic change. It is difficult, he says, to conceive in what other manner convulsions of the brain can arise so as to produce the effects which it is known to produce; and it is on consideration that the structure of the brain is so so minute and delicate, and so very susceptible of directing it, it is evident that there may be changes and alterations of structure which are imperceptible of dissection. (*Lectures*, vol. 14, p. 327.)

Mr. Abernethy, I think, has treated in a good deal of the propriety of the symptoms by dividing convulsions into two stages. In fact, without describing them, the various symptoms of the apoplexy, as given by different writers, cannot be as well received.

The first is that state of insensibility and decomposition of the body which immediately succeeds the apoplexy. While it lasts the patient scarcely feels any injury that may be inflicted on him. His breathing is difficult, but is given without exertion. His limbs are relaxed, and his extremities are cold. His mind is quite vacant, but a good deal probably, under the influence of motion, which is applied to the second stage of convulsions. In this, the patient is insensible to pain, and though not regularly performed, are said to be in motion. It is an affluence of the surface of the surface of the body. The body of the patient is not to be disturbed, except in a

state if he is to be disturbed; but he is insensible and insensible to slight external impressions. As the effects of convulsions diminish, he becomes capable of replying to questions put to him in a kind tone of voice, especially when they refer to his state and feelings of the time, as pain in the head, &c.; otherwise he answers incoherently, and as if his attention was diverted by something else. As long as the patient remains in this state of the brain, it is to be maintained; but as the effects diminish, the latter periods tend to increase, and thus continue the third stage, which is the most important of the series of effects proceeding from convulsions.

These several stages vary considerably in their degree and duration; but each or some of each will be found to take place in every instance where the brain has been violently shaken. Whether the last or certain symptoms, or each other or not, I do not know, indeed, they will depend upon a variety of circumstances in the constitution, the injury, and the after treatment; though most to be observed in the latter.

With regard to the treatment of convulsions, a well known fact in the first stage very clearly is, that the patient, when lying in bed, has been in motion, as the brain and nerves are probably, somewhat very suggesting that can be supposed. From a case, and I think, differences existing between the treatment in the first and that which exists in the second, the most powerful stimulus, such as wine, brandy, and volatile alkali, are commonly administered in, as to the patient can be not to swallow. The same may be said, which led to my explanation of these convulsions in the first stage, in order to reveal the identity, as given a kind of convulsion in the position of the body, with a view to control and the brain.

That the patient convulsions were first seen and less favorable. The symptoms of the brain have as far recovered as possible as to rest of the head functions in a degree sufficient to maintain the body in a state of equilibrium, which probably had been partly already weakened by the violent shaking of the day.

And it seems probable that these convulsions were not attended with inflammation, which may have arisen either state. (*Lectures*, vol. 14, p. 327.)

In most cases of convulsions, the patient remains in the apoplexy. According to Mr. Brodie, however, and according to generally early symptoms, and when recovery after the patient has recovered from the first shock of the convulsion. (*Med. Chir. Trans.*, vol. 14, p. 322.) In the beginning, a larger extent is the most general, and considerable difficulty in passing, as mentioned; but afterward the face is sometimes incoherently discolored, and the head becomes attended, seems to require the culture, but after a time the brain also comes away incoherently. There is sometimes blotting at the nose, and a part of the head which drops like the blood is removed by. The pupils of the eyes are partially dilated, but change, and are a little dilated, or sometimes only one. The state of the pupils, however, is differently regulated by different writers, and yet expansion has been found. It is subject to much variety. In that state in which the sensibility of the patient is impaired, but not annihilated, the pupils contract on exposure to light, and are sometimes more contracted than under ordinary circumstances. (*Lectures*, vol. 14, p. 328.) According to Mr. Abernethy, the pupils, although contracted when the patient is insensible, scarcely ever relax if it is disturbed by any effort made by the patient, and the pupils sometimes, probably with great force, in the latter symptoms is generally not relaxed, and is not less hours. The state of the pupils is very different, according to the stage of the disease. It is sometimes the pupils is at first dilated, sometimes contracted, and sometimes incoherently, and the pupils is a very little approaching that of the pupils. Each case is very different, and several cases after the pupils. With convulsions, however, that the pupils of the head is observed by Mr. Brodie to that the pupils of the pupils of the head. In general, when the pupils are not relaxed, and the pupils are in the state which has been described, a kind of the convulsions system takes place, and the pupils are with greater strength in proportion to the state of it was greater in the first instance. The pupils of the head has been unusually severe, there is a kind

above and below the wounded part; and when the parts are examined a short time after the hemorrhage has completely stopped, we find a strain of coagulated blood between the artery and the flesh, extending from a few inches below the wounded part to two or three inches above it, and somewhat thicker in some places than in the wounded part than elsewhere.

Hence, something that the hemorrhage is stopped by a coagulum, it is more correct to say, that it is stopped by a thick layer of coagulated blood, which, during the period that the wounded part is perfectly continuous with the coagulated blood lying between the artery and its sheath.—(Jones, p. 113.)

When an artery is incised, the immediate hemorrhage, by filling the lost space between the artery and its sheath with blood, and consequently distending the sheath, alters the relative situation of the puncture, so the sheath to that in the artery, so that they are not exactly opposite to each other; and by this means a layer of blood is excluded by the sheath over the puncture in the artery, and by compressing them prevents any further effusion of blood.

And this coagulated blood, like the external coagulum of a small artery, affords only a temporary barrier to the hemorrhage; its permanent compression is effected by a process of reparation or of absorption.

Dr. Jones's experiments prove, that an artery, if wounded only to a moderate extent, is capable of re-vascularizing and healing so completely, that after a certain time the hemorrhage cannot be discovered, either on its internal or external surface; and that even oblique and transverse wounds (which give most), when they do not open the artery to a greater extent than one-fifth of its circumference, are so filled up and healed by an effusion of coagulated lymph from their internal lips, as to become, in little or no distinction to the rest of the artery. The transient magnitude of a wound, which will still allow the continuity of the canal to be preserved, is difficult to be learned; for when the vessel is large, but yet capable of being sealed, such a quantity of coagulating lymph is poured out, that the rest of the vessel at the wounded part swells or less filled up by it. And when the wound is still larger, the vessel soon becomes either free or obliterated completely, so that its complete fitness is unimpaired.

Richard made a series of experiments upon dogs, whose arteries he said not to differ much from those of man, though the *superficial* of the heart is not so strong, and the blood is more coagulable; (two circumstances, which should be fully considered in applying any of the information drawn from such experiments to the human subject.) In his first experiment he pricked the femoral artery with a needle; the blood flowed, but soon stopped. On pressing the extremity it again flowed, but in a smaller stream; it gradually ceased to flow, and finally stopped, though the magnitude was again increased. On examination of the artery no trace of the incision was found. Several similar experiments had the same result. In experiment 4, he wounded the femoral artery, and made a longitudinal incision, as it rose from its sheath. The lips of the vessel were open in contact during the distention of the vessels, and to be separated by a jet of water during the rest. The blood was stopped by a coagulum; this was removed twice, and each time the vessel flowed in a diminished stream; but the animal died. In experiment 6, he made the same incision, but did not detach the sheath from the artery, and the wound was left to nature. The hemorrhage was the great; there was an extrusion of blood from the sheath, the size of an almond, which at the end of some days began to drain out, and disappeared in two or three weeks. On the fifth day he examined, fifteen days afterward, a little white ridge was found extending freely in the artery and to the sheath, and extending along the wound. In the interior, there was a deepened longitudinal curvature of the sheath of the fifth of a line. The canal was regular and pervious through its whole extent.

In experiments 7, 8, 9, he made transverse incisions of 1, 2, and 3 of the circumference of the femoral artery, separated from its sheath; in the arteries died. In experiment 10, he made a transverse incision through 1 of the circumference, without detaching the sheath. The bleeding was stopped by a coagulum, but on the animal revived it again flowed, and the dog died. On the next experiment of the same kind the blood was stopped by a coagulum, and the artery was closed by

nearly the same process as in the last experiment. So completely was the cure at the end of six weeks that the external part of the artery did not show any mark of a wound, and the vessels were secured observable on the internal surface. In his fifth experiment he cut one-half of the circumference (the external sheath) and sealed it by a coagulum similar experiments. In experiment 12, he cut 1 of the circumference; after the incision it was much relaxed the bleeding ceased, and the artery was closed in the same manner that it is when the section is complete.

A thousand experiments he concludes wounds of the arteries of dogs are cured by nature when they are only occasioned by a puncture, or a longitudinal incision, whether the artery be detached or not; but when arising from transverse incisions they are always fatal, if the artery be cut low. If the artery retain its sheath, and the wound be 1 of the circumference, it may be cured by the efforts of nature; but it is always fatal if 1 of it be cut through.—(See Quarterly Journal of Medical Medicine and Surgery, vol. 1, p. 35.) The inferences respecting the curability of a wound extending through 1 of the circumference, and the curability of one that affects only 1 of the circumference of the vessel, I should presume would require further examination, notwithstanding an accidental business produced by the sudden loss of blood in the first instance may have been the means of saving even one of the animals in which Richard made his experiments.

This author thinks it probable that a puncture, or longitudinal incision, in the artery of a man may be cured by nature; but that a transverse incision, however trifling in degree, so the clot become displaced, or, if a coagulum is formed, it will be dissolved and torn.

One fact made up by the same professor is, that when an artery is deprived of its sheath for an extent greater than its distance of an inch, the hemorrhage is mortal. I have not yet had time to look over the original paper; but it appears to me, that it would be desirable to know precisely to what extent arteries the nature is returning, when he is making some of the above inferences. The size and number of such animal, the subject of experiments, should also be particularly specified; as experiments made on the femoral artery of a large dog would surely not have the same results as those performed on the same artery of a large fox, weasel, or New Zealand dog.

According to Dr. Jones, the lymph which fills up the wound of an artery is poured out very freely both from the vessel and the surrounding parts, and it accumulates around the artery, particularly over the wound, where it forms a more distinct tumour. The exposed sensitive parts at the same time inflame and pour out coagulating lymph, with which the whole surface of the wound becomes covered, and which completely encloses the artery from the external wound. This lymph grows dense, and the wound is closed up and healed in the manner.—(See *Journal of Hemorrhage*, p. 113, &c.)

PRINCIPAL MEANS OF STOPPING HEMORRHAGE.

It must be plain to every one who understands the course of the circulation, that pressure, made on that portion of a wounded artery which above the wound towards the heart, must check the effusion of blood. The current of blood in the veins, running in the opposite direction, requires the pressure to be applied to that side of the vessel which is most remote from the heart. However, on account of the freedom, and facility with which the fluids are transmitted through the veins, blood, from the portion of the artery above the point of incision into the lower continuation of the artery, such pressure will often stop it, and not necessarily stop the bleeding, unless the part of the vessel directly below the wound be also compressed or secured. As pressure is the most rational means of stopping hemorrhage, so it is the most effectual; and almost all the plans employed for this purpose, are only modifications of it. The ligature, the ligature, the application of a roller and compression, even cauterization, only become useful in the suppression of hemorrhage, on the principle of pressure; the cautery, cauterization, and styptic, however, have a different mode of operation.

In order to prevent a wounded artery from being of hemorrhage, Dr. Jones wound the vessel to be tied with a silk, over which was laid a sponge of gold in cold water, and pressed on the part with the hand. It had

Withstanding these events, the hemorrhage should continue, he recommends immediately applying fresh lard, wet with vinegar; but he is against the use of corroding astringent applications, or at least of the inflammation which they produce; or only success the employment of the tanning issue. When the hemorrhage ceases these methods, he advises five ligatures to be applied to the middle part of the neck; and then dividing the portion situated between them. "Quod et illis quibus plagues venarum, sunt, sunt sanguinis fundant, apprehensibile: utique et, quod istum est, in quo sunt divergent, intercurrentes, sunt, et in se recipiunt, et coalescent, non perinde habent." —(Lib. 3, cap. 25.) When the ligatures were apprehended, the issue of blood prosperity, and no longer necessary measures were resorted to the bleeding part. Celcius reckoned the actual cure.

Gales also mentions tying the vessels for the purpose of stopping hemorrhages, and there are some traces of the same information in other authors, who lived before him, as Arctagoras and Galien. Probably, however, the ligature was little used at those early periods, as may be inferred from the treatment of hemorrhages, caustics, and other applications, which were advised for stoppage of bleeding, and in which less caution would have been paid, had the use of the ligature been familiarly known. No one can doubt, that if the old surgeons had had many specific cases of severe hemorrhages of the ligature, they would soon have used it after dissections; but so far were they from adapting any remedy, that Albucasis, a long while afterwards, refused to operate at the wrist, lest he should see his patient bleed to death.

Part is considered as the first who regularly engaged in the licit use after annihilation. His method having been attacked, he speedily disavows it in the part of the works entitled *Apologia*, where he takes great care to insure the origin of it to the successors, and cites many of those who have made mention of it. However, he thinks it unnecessary in any paragraph of such consequence, that he ascribes his first adoption of this practice to remembrance of the Bible.

The method by which the accounts played upon confidence by the mortgagee-bankruptcy after the expiration of a week, was the characteristic of the car vessel, and surrounding fleet. The same idea affected by the self-ruined an engine, at ground or lost (broken), which blocked up the opening of the vessel, and hindered the coast from escaping. The separation of the engine, however, which eventually took place in some, occasioned a return of bankruptcy, and produced in the more dangerous, as the bankruptcy was now more difficult than before the casualty had been noticed. Sometimes the structure, being too weak to stand, immediately brought away with it the engine. At the present time, the casualty is never employed as a means of suppressing bankruptcy, as, at best, only two or three very unusual cases, in which either compression or the ligature can be made use of. In Great Britain, the casualty can be said to be entirely abolished; but in France, the best surgical surgeons recognized this employ, it is described thus from the attitude of the vessel.

The hot stuporosa also very generously apportioned to bleeding urine placentas, dipped in boiling turpentine—a residue that has come from even freshly shaved wood.

LESTER KUBIE, M.D., WILLIAM L. KUBIE, M.D.

[illegible]

M. is then 25 from large arteries, continuous case after be gradually made, as when these vessels in the immediately over a bone. Bleedings from the radial and temporal arteries are especially noted as cases of this kind, though from the many instances of failure which I have seen happen where the first of these vessels is concerned, I should be reluctant either to advise or make such an attempt. Compression is sometimes tried, when the radial artery is wounded in the forearm. Here it is obviously tried, as preference to the ligature, because the latter cannot be employed without an opportunity to expose the artery.

When there is a well defined, large artery, the following plan may be tried: a ligature is introduced, as far as extended the flow of blood into the vessel. The edge of the external vessel is next to be incised into a slit. Then a compress, shaped like a thick cone, and which is best formed of a series of compresses, gradually increasing in size, is to be placed with its apex exactly on the situation of the wound in the artery. This graduated compress, as it is termed, is then to be bound on the part with a roller.

In this manner, I once bound a wound of the superficial palmar arch, in a young lady at St. George's Hospital. The external wound was very small, and though the hemorrhage was profuse, I imagined that it might be permanently stopped, if compression could be so made as to keep the internal wound incessantly and firmly covered for the space of a day or two. At first, I tried a compress of lint, bound on the part with a roller; but this proving inefficient, I took some pieces of muslin, from the size of a fingertip to that of a half-crown, and, wrapping them up in linen, put the arterial end accurately over the wound, so as completely to cover it. Then the others were wrapped, and all of them were finally confined with a roller, and the next best as quiet as possible in a sling. They were taken off after three days, and no hemorrhage ensued.

It is to be observed, that the palmar fascia, in this instance, would prevent the compression from operating on the vessel; but the case shows that this artery, when wounded, is capable of healing, if the blood be completely prevented from getting out of the external wound by the proper application of compression. Were the outer wound too large to admit of this plan, it would probably be the same practice to put down, at once, to the artery artery, and put a ligature round it, though, as this would very certainly stop the bleeding from out of the vessel in the hand, pressure on the wound would yet be necessary. I have never seen a vessel wound in making the artery is the kind.

Inside compressing the wounded part of the artery, some surgeons also employ a longitudinal compress over the track of the vessel above the wound, with a view of weakening the flow of blood into it. Whatever good effect it may have in this way, is more than counterbalanced by the difficulty when it must occur to the circulation in the arm. If the graduated compress is properly arranged, an effusion of blood cannot possibly happen, and pressure along the course of the artery need at all extend to the extremity. After missing the blood-vessel, if no blood escape from the artery, the surgeon, however, it is to be his constant duty, whether he is certain that the pressure employed is not so powerful as actually to stop the circulation in the forearm and hand. The aim is to keep strictly in a sling, and, as long as there is no bleeding, to place, then, with great caution to prevent that the arm will do well. In this work, I have given no suggestion and description of an instrument, intended by Pott, for making pressure on the wounded femoral artery, at the level of the femur, without passing upon the whole circumference of the limb and consequently without stopping the circulation. For one, however, would prefer not to press upon large arteries are required, except in the kind of cases in which we have just been advised, or in those in which the wounded vessel can be freely compressed against a bony point. Pressure on the circumference of an artery, as the hand, as the femur, and a firm bandage may arrest; and with greater risk is that of nutrition from the unobstructed course of the limb. When the method is tried, the ligatures should always be left loosely around the limb, ready to be tightened in an instant.

Sometimes the external wound heals, while the opening in the artery remains unobstructed, and a false aneurysm is the consequence.

OF THE LIGATURE.

When hemostasis takes place from a large artery in one of the limbs, where the vessel can be conveniently compressed above the wound in it, a short ligature, judiciously applied, never fails to put an immediate stop to the bleeding.

Before the invention of this instrument, which derives its name from the name of the 17th century surgeon, who first used it, a very delicate one. But ligatures of various kinds could be introduced in the extremities, without placing the patient in the most painful position; and many wounds were made, which, with the aid of this simple operation, would not have been attended with the least danger.

The first instance of the instrument has been claimed by J. (1741) surgeon, and ever since it has been used, wherever the ligature, it was first proposed to the public in a form exceedingly simple, so much so, indeed, that it seems extraordinary that its invention did not happen sooner. A small pad being placed on the principal artery of a limb, a band was applied over it, so as to exactly fit the limb. Then a stick was introduced between the two ends of the band, which was twisted; then the pad was made completely to stop the flow of blood into the lower part of the limb.

Although in the 18th century the use of this instrument was a great improvement, it was not until the middle of the 19th century that its use was generally adopted. It is now the first and most important step in the treatment of a wound of a vessel, J. L. Pott is universally agreed to be the first who brought the instrument to perfection, by combining the twisted band with a screw, so that the pressure produced was applied to the principal artery.

The advantages of the modern form of the instrument are, that its pressure can be regulated with the utmost exactness; that it operates chiefly on the point where the pad is placed, and where the main artery lies; that it does not require the aid of an assistant to keep it tight; that it completely compresses the flow of blood into a limb; that it can be relaxed or tightened in a moment; and that, when there is reason to fear a sudden reversal of hemorrhage, it can be left loosely round the limb, and, in case of need, tightened in an instant. The only, however, is attached to the handle, and so the pressure necessary to stop the flow of blood through the principal artery completely prevents the return of blood through the veins, the application cannot be made very tight without inflicting mortification. It is only of use also in putting a sudden stop to profuse hemorrhages for a time, that is, until the surgeon has got to practice some means, the effect of which is more permanent.

OF THE LIGATURE.

The ancients were very unacquainted with the use of the ligature, and though some of their writers have made mention of the ligature, they do not seem to have known how to make proper use of it, nor to have possessed any other certain means of stopping hemorrhages from wounds. In modern times, it is justly considered that what any great surgeon was indebted, while surgery was so imperfect, there was more than food of the patient's life being threatened their lengthened, by what was attempted. Under these circumstances, it is not surprising that the old practitioners should have taken immense pains to discover a great many topical remedies. The new school, however, is known to be a teacher which is only and less power than these methods, no longer could find to make for specific and permanent hemorrhage.

It may, indeed, be said, as a rule in surgery, that whenever large arteries are wounded, no other application should ever be resorted to, but immediate compression should be resorted to, for immediate compression is the best and most certain of all methods.

In order to qualify the reader to judge of the best mode of applying ligatures to arteries, I shall first explain to him their effect on these vessels, as stated by Dr. Jones.

The position learned from Dr. J. Thomson, of Edinburgh, that a vessel is not to be cut, a ligature is applied around an artery, without including the surrounding parts, the vessel root of the limb is torn through by it; and that this has been originally

incised by Denon. Dr. Thomson even demonstrated to Dr. Jones, on a portion of artery taken from the human subject, that the internal and middle coats are divided by the ligature.—(*Journ.* p. 124.)

Thus did Dr. Jones make some experiments on the arteries of dogs and hares, touching to the constitution, that while several ligatures are applied round an artery with such close application to each other as to interfere with the coats, although the coats be immediately afterward removed, the vessel still remains closed. In proof of the part which was tied, as far as the first collateral branches open and below the obstructed part. Dr. Jones thinks it reasonable to expect that the obstruction produced in the arteries of dogs and hares, in the manner he has related, "might be effected by the same treatment in the arteries of the human subject; and if it should prove successful, it might be employed in cases of the most important cases in surgery. The success of the late important operation in which three arteries were tied in the operation for aneurism, only perhaps equal to most operations he have recorded, and operating sufficiently simple and safe; but if it is possible to produce obstruction in the canal of an artery of the human subject in the above-mentioned manner, may it not be advantageously employed in the case of aneurism; inasmuch as without need to wait to prevent the immediate action of the external vessel?" Dr. Jones asks questions whether this mode of obstructing the passage of blood through the arteries may not be advantageously practised in cases of hemorrhoids!—(*P.* 124.)

Subsequent experiments have not been equally successful with Dr. Jones in obtaining the obliteration of the artery of the vessel after this operation. Did this difficulty depend from their having tied the vessel only in one place? Mr. Hodgson made the experiment in connection upon the external arteries of dogs; and in order of them was the artery of the vessel obliterated. The same experiment has been repeated by several surgeons upon the arteries of dogs and hares, but in no example, as far as Mr. Hodgson knows, has the complete obliteration of the artery of the vessel been accomplished. However, as an effect of ligation is an inevitable consequence of the operation, the want of success is owing to the opposite sides of the vessel not being retained in a state of contact, so as to allow of their adhesion.—(*See Observations on the Application of the Ligature to Arteries, &c.* by R. TRAVERS, vol. 4, Med. Chir. Trans.) The presence of the lymph, in the various coats of its application, effects the object; and for the success of Dr. Jones's experiment, it appears only necessary that the opposite sides of the wounded vessel should be retained in contact until their adhesion is sufficiently consolidated to resist the passage of the blood through the tube. This object might probably be effected by compression; but the inconveniences attending such a degree of pressure as shall retain the opposite sides of an artery in contact at the bottom of a wound would be too great to permit its employment. It occurred to Mr. TRAVERS, that if a ligature were applied to an artery, and suffered to remain only a few hours, the adhesion of the wounded surfaces would be sufficiently accomplished to ensure the obliteration of the canal; and by the removal of the ligature at this period, the intervention of strapping the artery would be avoided. The danger produced by the constriction of a ligature upon an artery arises from the stricture which, as a foreign body, it produces in its coats. Ligation has never been shown to be necessary in less than twenty-four hours after the application of a ligature; while it is an acknowledged fact that lymph is in a favorable state for organization in less than six hours, in a wound the sides of which are preserved in contact.—(*Journ.* chap. 4, exp. 1.) It is sufficient, therefore, to ensure their adhesion, that the wounded ends of an artery be kept in contact by a ligature only three or four hours, afterwards and allowing only in a great degree to be removed by preventing the immediate admission of the blood. Justified by this reasoning, Mr. TRAVERS performed several experiments, by which he ascertained, that if a ligature be kept six, ten, twelve, or even one hour upon the external artery of a hare, and then removed, the artery is sufficiently adhered to secure the permanent obliteration of the canal. It appeared probable that the same result would be obtained upon the blood-vessels of a human subject.—(*Hodgson on the*

Arteries of Arteries, &c. p. 228, at seq.) Mr. A. G. HASTINGS, in the year 1800, tied the branch of an artery of two dogs, and removed the ligature immediately after their application. In both instances, the complete obliteration of the vessel of the artery was the consequence of the operation.—(*See Practical Observations on Surgery, p. 125.*) He has also tied this vessel, as testified by Mr. TRAVERS, in an operation which is performed for a ruptured aneurism in a vessel, in the thigh. A single ligature was passed under the injured artery. The ligatures were tied with linen or silk-threads, about a quarter of an inch of the vessel being left undisturbed between them? As that time elapsed, the pulsation in the vessel was a slight indistinct motion. Twenty-six hours having elapsed since the application of the ligatures, the vessel was carefully opened, and the ligatures tied and removed, without the slightest disturbance of the vessel. It less than had a minute afterward the artery being dissected with blood, and the pulsation in the artery even as strong as they had been before the operation. Mr. HASTINGS then applied two fresh ligatures, an inch apart, and the patient died.—(*See Practical Observations on Surgery, p. 125, &c.*) Now, as Mr. HASTINGS shows in applying ligatures, we find that the pulsation returned, the above case only proves that the artery was not obliterated in about six hours, and as we are left in the dark respecting the great question, namely, whether the vessel would have become obliterated by the effect of organizing lymph and the adhesive inflammation, notwithstanding the state of resistance through it. As for the hemorrhage which occurred, I think it might have been avoided, consisting the disturbance and irritation which the artery must have sustained in the proceedings, thereby necessary for the application of not less than two ligatures, and also increased in kind of them. Accordingly say above, only one ligature ought to have been used, and time of the artery described. We also learn in connection on the use of ligatures which were employed, the successful issue of ligation in forming a judgment of the merits of the preceding method. The application, removal, and reapplication of ligatures are not consistent with the new principles promulgated by the late Dr. Jones, and have, in every instance, that attended by my friend Mr. HASTINGS, brought in obliteration of the artery and hemorrhage. For further information on the question concerning the power of withdrawing the ligature previously to its withdrawal, see the article *Aneurism*.

From Dr. Jones's experiments, it appears that the first effects of a ligature upon an artery are, a complete division of its internal and middle coats, the tearing of its wounded surfaces into contact with each other, and an obstructions to the circulation of the blood through the canal. There must be a small quantity of stagnant blood just within the extremity of the artery, but this does not, in every instance, immediately form a coagulum capable of filling up the canal of the artery. In most cases, only a slender coagulum is formed at first, which gradually becomes larger by successive coagulations of the blood; and hence the coagulum is always at first of a tapering form, with its base at the extremity of the artery. But as Dr. Jones says, the formation of this coagulum is not material, for soon after the ligature has been applied, the rest of the artery swells, and the wounded internal surface of its coat being kept in close contact by the ligature, adheres and converts this portion of the artery into an important wall, at first, slightly oblong and. It is in the effect lymph that the base of the coagulum adheres, when found to be a vessel. Lymph is also effused behind the coats of the artery, and among the parts approaching its extremity. In a little time, the ligature under the part on which it is directly applied swells, and acting as a tent, a small aperture is formed in the left of lymph effused under the artery. Through this aperture a small quantity of pus is discharged, as long as the ligature remains; and finally, the ligature itself becomes necrotic, and the little cavity which it has occupied gradually and fills up, and the external wound heals, leaving the cellular substance a little beyond the end of the artery again thickened and indurated.—(*Journ.* p. 125, 126.)

In short, when an artery is properly tied, the following are the effects, as enumerated by Dr. Jones:

1. To cut through the internal and middle coats of the artery, and so bring the wounded surface into perfect apposition.

2. To cause a dissemination of blood to the entire arterial branch.

3. To allow the formation of a coagulum around and within the artery, *per se*, and a collateral branch below every point of the ligature. In certain particular cases, however, that being the basis of a collateral branch prevents the formation of the coagulum, a coagulum may prevent the completion of the arterial process. In the experiments made on the arteries of fishes and dogs, by Mr. Brown, the ligature was regularly applied twice to each artery, because, on the second, more easily obtained.—(See *Med. Chir. Trans.* vol. 5, p. 426, 427.)

4. To create infarction in the internal and middle coats of the artery, by having cut them through, and consequently, to give rise to an effusion of lymph, by which the wounded surface is united, and the coagulum is rendered permanent, in position, a coagulum is likewise formed in the surrounding arterial surface of the artery by which it becomes very much thickened with effused lymph; and, at the same time, from the exposure and inevitable wounding of the surrounding parts, an immense infarction is formed, and an effusion of lymph, which converts the artery, and forms the surface of the wound.

5. To produce absorption in the vessels of the artery around which the ligature is immediately applied, and an external one.

6. To produce ultimately a complete obliteration, not only of the vessel of the artery, but even of the artery itself, to the collateral branches on both sides of the part which has been tied.

7. To give rise to an enlargement of the collateral branches.—(See *Journal*, 1823, 1834.)

Every part of an artery is organized in a singular manner to its other soft parts, and its coats are susceptible of the same process of absorption, increase, &c., as the other parts are. Hence, the preparations taken to secure the effect of other parts should be observed for the same purpose with regard to an artery. The blood is put in a state to admit of adhesion by the ligature, which, when properly applied, cuts through the internal and middle coats, keeps these cut surfaces in contact, and affords them an opportunity of uniting by the adhesion of albumen, as other cut surfaces do. The immediate stoppage of the blood in arteries the ligature and temporary part of what the ligature has to accomplish, it has also to effect the adhesion of the internal and middle coats of the artery, which, being the state on which the permanent suppression of hemorrhage depends, is the most important. The state of the artery, whether completely tied, or compressed, have no effect, as Dr. Jones remarks, sufficiently attended to; nor is the degree of force employed in tying the artery after considered. Some surgeons, wishing to guard against the ligature slipping off, tie it with very considerable force; while others, apprehensive of cutting through the artery, or of decomposing too early a separation of the ligature, draw it only sufficiently tight just to prevent the escape of blood. A broad flat ligature is not likely to make such a wound in the internal and middle coats of the artery as is more favorable to adhesion, because it is scarcely possible to do it in a manner round the vessel, which is very likely to be struck, cut aside, or ruptured by it, and consequently to have an irregular, broken wound made in its middle and internal coats. By applying also a considerable strain of the external coat, it may destroy the very vessels which join it in their way to the cut surface of the lower coats, and thus render them incapable of flowing. Thus opposing the speed to flow, and with a ligature that covers that part of the external coat which is directly over the newly united part, and, consequently, as soon as it has produced absorption through the external coat, it will have the same effect on the newly united parts, and, of course, secondary hemorrhage.—(See *Journal*, p. 185.)

When a incision is to be made in an artery, it is apt to cut through the internal and middle coats of an artery more completely at some parts than others; but these parts may be perfectly cut through, in order to produce an effusion of lymph from the inside of the vessel, which seems to affect most early at its cut surface.

Also, when the ligature is not applied with sufficient tightness, the inner coats of the artery will not be properly cut through. Dr. Jones thinks that the ligature, being sometimes put on so as to divide from a circle, has a tendency to produce secondary hemorrhage.

Dr. Jones observes that ligatures are less, when they are intended and apply them; and he adds, that though they are slightly necessary to cut through the internal and middle coats of an artery, it is better to be the vessel more easily than to necessarily destroy it cut through its inner coats, because the cut surface will then be more easily kept in contact; the separation of the ligature impeded; and the danger of absorption spreading to the healthy surrounding parts diminished. The material part will never absorb through more than its long ends have adhered. The link, however, should be kept in a perfectly quiet state.

I am sincerely glad to find that no moderate an obstruction as Dr. Jones has referred the idea that ligatures occasionally slip off the vessels, in consequence of the violent action of the blood. In fact, the blood does not continue to be applied against the extremity of the artery, with the same impetuosity with which it is expelled through the vessel before it was tied. The blood is immediately converted into the collateral branches, and is there any pressure for some way above the ligature.

Dr. Jones, indeed, more rationally imagines this accidental accident arises from the constriction of the artery, which prevents the lymph entering and covering round the artery, or to the last having been applied with sufficient tightness, or to its having that very minute hole of the vessel which the deviation from the circular application would produce.—(P. 123.)

Dr. Jones is of opinion, that in cases of aneurism, in which the artery has only been tied with one ligature, and left undisturbed, and in which secondary hemorrhage has arisen, that this has most probably been arising either from the changed state of the artery; or to some extraneous far from passing a large portion of the vessel; or to some loose ligature about the end which is tied; or, lastly, or not tying the artery sufficiently tight to cut through the internal and middle coats, so as to fit them for adhesion. The latter supposition, hardly has to produce a gradual absorption of these coats, and to cause bring on hemorrhage, which returns with greater violence as the absorption advances.—(P. 125.)

These remarks must also strongly explain why Scarpa's practice of using a large ligature, with the intervention of a piece of cloth between the cord and the vessel, for the express purpose of kindling the outer coats of the vessel from being divided, must be objectionable, because it may burst down as an aneurism in all positions where large arteries are to be tied, and particularly of such as are in contact with the artery, should be diminished as much as possible. And though it may be disposed to go so far with Scarpa as to believe that the introduction of a piece of cork or wood is more than that of a cylinder of linen, I cannot assent to the proposition that the latter is free from objection, because it gives rise to a cushion, than as a body likely to burst.—(See *Mem. on the Ligature of Aneurism*, p. 45.)

With the difference in the constitutions of men and animals, I know that the results of experiments on the latter can never be looked upon as a positive proof of what would happen from the same experiments performed on the human subject. The stronger or weaker impulse of the heart, the more or less sanguine state of the blood, the greater or less degree of general and local anæmia, the state or loss of quick tendency to adhesion, inflammation and absorption, are circumstances which must make in different manner the same experiments lead to opposite results. The question whether a small round ligature, or a larger flat one, with a piece of linen between it and the vessel, be best, must therefore, after all, be decided, not by Dr. Jones's experiments, nor those of Scarpa, or Elliot, but by the practice of surgery on the human body; and that the principles defended in this Dictionary are, on the whole, to be preferred, can hardly be questioned by any man who knows how much less frequent secondary hemorrhages now is in this metropolis than it was formerly, when those principles were justly observed and comprehended.—(See *Anatomical, Anatomical, Anatomical, and Ligature*.)

Dr. Jones seems to consider, that the advantage of the retraction of the divided artery within the vascular sheath is compensated, in the case of the divided artery, by the speedy and profuse effusion of lymph, which takes place over and round the vessel at the distal part, and soon covers the ligature itself. Another cause of secondary hemorrhage is, the loosening of other parts in the ligature, together with the artery; by means of which the division of the inner coats of the vessel may be prevented.

In the valuable publication of Dr. Jones in which I have so freely availed, some secondary hemorrhages are also assigned to the laceration or separation of the recently united parts of an artery, by pressure and extraordinary exertions of the patient. Hence, his strongly is now on keeping a limb in which a large artery has been tied perfectly at rest.

I shall conclude these remarks on the ligature with a few practical rules.

1. Always tie a large artery as separately as possible, but still let the ligature be applied to a part of the vessel which is close to its natural constriction.

Results the persons for this practice already specified, we may suppose, that including other substances in the ligature causes increased pain, and a larger part of a vessel to remain divided. The ligature is also apt to become loose, as soon as the adhesion between it and the artery sloughs or dissolves. Sometimes the ligature, thus applied, forms a circular groove in the flesh, and remains a tedious raw, susceptible of a separation.

The blood-vessels being organized like other living parts, the breaking of a vessel and artery can only take place favourably when that part of the vessel which is immediately contiguous to the ligature continues to receive a due supply of blood through its own vessels, which are ramifications of the collateral arteries. Hence the disadvantages of putting a ligature round the middle of a portion of an artery, which has been separated from its surrounding connections; and hence the utility of making the knot as close as possible to that part of the vessel which has retracted against the surrounding flesh.

Small arteries neither allow nor require those minute attentions to the mode of tying them.

2. When a divided artery is large, open-mouthed, and quite visible, it is best to make hold of it, and raise its extremity a little way above the surface of the wound with a pair of forceps. When the vessel is smaller, the hemorrhage is the most convenient assistant.

3. While the surgeon holds the vessel in this way, the assistant is to place the nose of the ligature under it, and to it, according to the above directions. In order that the nose may get fine and high, and even above the mouth of the artery, when it is tightened, the ends of the ligature must be drawn as far apart as possible, which is best done with the thumb. A knot is next to be made.

4. As ligatures always separate in wounds as extraneous bodies, and are half of such a sufficient for the removal of the wound when drawn, the other should be cut off close to the knot, and taken away.

As we have explained in the article of Application, and as we shall before again in speaking of the Ligature, these have of long years been under the pressure of cutting off both ends of the ligature close to the knot, with a view of diminishing, as far as possible, the quantity of extraneous substance in the wound. This plan requires the use of very small silk ligatures, in order to be fully justified of.—See Mr. Lawrence's *On the Ligature*. Paris, vol. 6, p. 143, of sec. 1.

5. When a three-artery is completely divided, two ligatures are to be tied, the other on the lower part of the artery is not so necessary, it is recommended by the experienced surgeons employing the knot very readily into the part of the artery most remote from the knot, as soon as the first ligature has been applied.

6. When a large artery is only punctured, and no pressure must be put on it, the vessel is to be first exposed by an incision, and then a double ligature introduced, made it, with the aid of an eye-pick. One ligature is to be tied above, the other below the bleeding orifice, with the arteries in the position explained in this article, and then cut and buried.

7. Ligatures usually cover away from the wound artery over and, in case of a hemorrhage, and from those of moderate size in six or seven days. When they col-

lapse attached much beyond the point period, it is proper to draw them very gently every time the wound is dressed, for the purpose of accelerating their detachment. Great care, however, as to the mode of doing this, as Mr. Jones remarks, as long as the ligature seems firmly attached, placing a moist sponge, moist with water or alcohol the recently separated extremity of the artery, which is not only necessary in it, but is not wanted in that period of the artery (the external coat) which remains the ligature.—(See p. 115.)

In particular individuals there appears to be an extraordinary tendency to hemorrhage from very slight injuries. An instance of this kind has been recorded by Mr. Hughes, where a small hemorrhage arose from the extraction of a tooth. The patient, who was twenty-seven years of age, had lost a tooth without a loss, in consequence of which operation the bleeding continued for twenty-one days from the socket before it ceased. A very slight cut on the hand was also followed by an alarming hemorrhage, which could not be stopped by pressure, or pressure, or the ligature, so that it became necessary to apply the last process, which succeeded. He has since another career with this sort, a profuse bleeding followed, which issued in effect of dyspepsia, emaciation, and every kind of ailment as the result. The actual cause was not ascertained. The danger of this kind of hemorrhage is to leave no other resource, but that of tying the vessel, which was done by Mr. Hughes. He says the proceeding failed to suppress the hemorrhage, which proved fatal.—(See Med. Lib. Trans. vol. 4, p. 12, Lond. 1815.) In the mode of stopping hemorrhage from the sockets of the teeth, the reader may find some remarks in the *Edin. Med. and Surg. Journ.* Vol. 1, p. 161.

The hemorrhage from the bites of insects sometimes proves exceedingly abundant, and sometimes of long duration, these have occasionally happened, particularly in children. When common methods fail, it has been best, perfectly tried of passing a fine sewing needle through the skin on one side of the wound and then another through the skin on the opposite side, and then twisting some thread round the needles, so as to draw them together, and close the bite. The experiment fully answered.—(See *Edin. Med. Repository*, Vol. 1, p. 21, 1815.)

For more information respecting hemorrhages, see *Amputation*, *Amputation*, *Arteries*, *Arteries*, and *Wounds*.

Consult also *Pott's Memoirs*, among them *of Treat. des Arteries* for the years 1770, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 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Journal, Vol. Paris, 1855. John Grant, A Case of Anomalous, with some Experiments and Observations on the structure of Arteries with minute fine Ligatures, in *Lond. Med. Repository*, vol. 7, p. 334. "The author relates several experiments for the purpose of ascertaining the ability of living arteries with such ligatures, and within the few weeks of time to the end. They were performed on the carotids of dogs and cats. The conclusions are unfavorable to the practice. After one case of amputation, where the patient was tried, the artery healed slowly, and for several months small aneurysms repeatedly formed."

HEMORRHOIDS. (From *haima*, blood, and *rhoe*, to flow.) Piles, divided into such as do not bleed, and termed blind, and into others which in occasional hemorrhages, and distinguished by the epithet of anal. The etiological sequence of the disease is evidently only a discharge of blood. Scrophulous, however, sustained by long violence, have generally supplied by the term hemorrhoids either a simple bleeding from the veins of the lower part of the rectum, remaining many or less frequently, yet not accompanied with any discolourable permanent tumour within, or on the outside of the anus; or else aneurysms formed by a various distension and morbid thickening of those vessels, either with or without occasional hemorrhage; or lastly, tumours slightly produced by effused blood, but subsequently converted into an organized substance.—(Abernethy, *Surgical Works*, vol. 3, p. 324.)

According to Richter, blind hemorrhoids consist of preternatural cysts or sacs at the lower extremity of the rectum, from the size of a pea to that of an apple. Sometimes they are distended with blood, and very much swollen, and another period entirely subsides; though, when they have been often considerably swollen, they never quite disappear, but are alternately, in a full enlarged state suddenly and tacitly. Indeed, the more frequent and considerable the enlargement has been, the greater is the risk. It is generally supposed, that these tumours or cysts are various expansions of the veins of the rectum; and probably, says Richter, this may sometimes really be the case; but the disease is not always of this nature. In particular instances, and, perhaps, in most cases, they arise from an extravasation of blood under the inner coat of the rectum; and then the cyst is altogether formed by this excretion, and not by distension. The following circumstances furnish proof of what has been here observed. Hemorrhoids are sometimes as large as a walnut or apple; yet it is scarcely credible, that a mere tumour could sustain such a strain. When set away, the bleeding is often very slight, even when they are large. Surely, if the tumours were various, there would always be profuse hemorrhage. Sometimes the cyst is found quite empty; but how can a cyst be supposed to be in that state? The shape of hemorrhoids is also remarked to be subject to greater variety than can hardly admit of doubt; of which, that they are sometimes oblong, sometimes cylindrical, like a finger, &c. Lastly, when set away, the size is usually seen to assume only of a single magnitude.—(Abernethy, *de Vaginitis*, A. 6, p. 28, ed. 2, Gall. 1803.)

At the same time, it should be collected that in the bloodlessness consequent on the effused vein, and the swelling becomes hard, indurated, and very painful. The collection is subsequently absorbed, but the thickened coats of the vein and the surrounding parts form a tumour which is liable to inflame and shed great disease.—(Hoffman in *Journal of Medicine*, A. 6, p. 265.) In short, all surgeons who consider the disease as various, plead, with Sir E. Home, that in cases of long standing, the contents of hemorrhoidal tumours "coagulate and become solid; these cysts increase in thickness, and they remaining persistent expose to various other situations in the body."—(De Boer, &c.) Avoiding, however, of the extensive opportunity afforded by his directing point, Mr. Keay has taken some pains to ascertain the nature of these tumours; and he observes, "I confess you say, that they seemed to be formed of a various distension of the great hemorrhoidal vein, even in a single instance. In every case of extreme hemorrhoids, the cancer appeared to be composed of a preternatural of the rectal substance in a state of unusual firmness, supported by some vein, and covered by the integuments. The veins were branches of the internal iliac. In every case of internal hemorrhoids, the structure was pretty similar. The veins, however,

were enlarged, and were branches of the hemorrhoidal."—(On certain severe Forms of Hemorrhoidal Excrescence, p. 40.)

The opinion that piles are formed of cells filled with blood is also adopted by Mr. Keay. The structure of the hemorrhoidal veins with blood, he observes, gives rise to tumours; but if any of their blood is extravasated in the cellular membrane, in the interior and internal part of the mass, hemorrhoids are the result. If the cellular membrane, void of democracy in hemorrhoidal patients, the transference of the vessel are with tenderness in these cysts of blood, and are completely removing the whole, the hemorrhoids appear suspended from the branches of the vein, as grapes from the vine.—(See *Keay Med. & J. Soc.* 1825.) Whistler, well known as the author of a famous treatise on the present subject, is the only writer who defines a hemorrhoid to be a preternatural distension of blood (phlegm, sanguis) to the extremity of the rectum, because he conceives that hemorrhoids, scrophulous, &c. are scrophulous circumstances, not constantly attending the disease.—(See *Med. des Sciences* A. 6, p. 445.)

Whether the contents of some piles being formed of distinct cysts, or mass of blood be correct or not, there is no doubt, that the tumours sometimes consist of a various enlargement of the branches of the hemorrhoidal vein. Were this not the fact, how could cases like the following ever take place? "One of my patients (says M. Delamar) had several of these tumours of very large size, and at every contraction of the sphincter and the blood issued from them, as water."—(Med. Phil. vol. 211.) Monteggia has likewise seen two instances in which the blood issued out of the tumours in a continued stream.—(Med. des Sciences A. 6, p. 452.) And Richardson mentions a physician who lived to the age of eighty-two, quite free from infirmity, and whose good health was ascribed to periodical bleedings from piles, during his years of his life; the evacuation being very regular, and so profuse, that the blood was always some distance, as from a vein opened in phlebotomy.—(See *Boerhaave*, Chir.) If such piles were not either tumours, or cysts in direct communication with the large veins of the rectum, it is would not have succeeded in taking blood from them by pressure, as he often did in the case of the ordinary mode of venesection.—(Med. Chir. T. 2, p. 131.)

Hemorrhoids may, in number, size, form, and situation, some being external; others internal; and some hardly larger than a pea, while others exceed a hen's egg in size. Sometimes they bring on very serious complaints, either by harassing and discharging blood copiously and dangerously to exhaust the patient; or by exciting inflammation of the adjacent parts, and causing abscesses and fistula; or, lastly, by becoming strangulated by the contraction of the sphincter ani, so as to occasion severe pain. Piles which bleed but little are not of much consequence; but those which bleed profusely cause violent pain, or which induce inflammation and all its effects, demand the greatest attention. External tumours of a person who lost three quarters of blood from some piles at the centre of a couple of days; and both Arnes and the celebrated pathologist Cullen are said to have died so death as the matter.

I do not know what remedy ought to be given to the hemorrhoids caused by Puzos, in which a Spanish soldiering walked every day, six feet, a pint of blood from some hemorrhoids, and yet enjoyed perfect health.—(See *Chir. Journal*, 2, p. 46.) For other curious facts of this nature, see *Med. des Sciences* A. 6, p. 452.

As Mr. Rowland remarks, hemorrhoidal tumours, when combined with inflammation, are very painful. "The patient can then neither walk, ride, nor sit; the only tolerable state being that of rest in the recumbent position. Should fail, during the continuance of inflammation, be obliged to place a tumour, the distress is extreme. With these symptoms there is generally, more or less feverish heat and tenderness, more and more distress."—(On Diseases of the Lower Intestines, p. 325, ed. 5.)

In passing, when piles are situated far up the rectum, they are less painful than when lower down, and sometimes the patient is not conscious of having them till he begins to void blood from the rectum. In the former case, the veins of tumours are surrounded by soft and yielding substances, which do not make

any painful pressure on them; but when they are situated towards the anus, they often suffer painful compression from the action of the sphincter muscle. Mr. Horsburgh met with two examples where hemorrhoidal swellings were situated with inflammation, and so violently strangled by the spasmodic action of the sphincter, that the parts underwent a spontaneous identification, and a radical cure was the result.—(*J. Transactions of the Medical Association, vol. 2, 1843, p. 23*.)

With regard to the *relief of hemorrhoids*, any thing capable of extending the action of blood through the hemorrhoidal veins may be considered the disease. The pressure of the gravel *lithis*, catarrhs, and the frequent retention of hardened feces in the rectum, are very frequent causes. Persons who lead sedentary lives are often troubled with the complaint. Women are even attacked in child birth.

The removal of the enlarged liver, or of water accumulations in the cavity of the peritoneum, may occasion relief.

I have adverted to the opinion of Meisner, that hemorrhoids depend upon a determination of blood to the lower part of the rectum; which supposition is perhaps correct in cases where the disease assumes hemorrhoidal in that form, in the neighboring parts.

When the tumors are produced by the pressure of the great artery, no cure can be expected (if the delivery, when once passed, follows spontaneously). Alas! when piles are an effect of disease, they cannot get well before the pressure of the fluid in the abdomen has been removed by bleeding. Gentle laxative medicine and a protracted position of the body tend to alleviate the pain, and induce the evacuation of feces. Through the action of an external compress of equal parts of the powder of oak-bark and of sugar of lime, or high fluid compresses to the same beneficial effect. The application of warm water by means of a bath, or enema, or local vesicatory produces relief in great cases. When piles are constituted by the sphincter too spastic, the pain may often be at once removed by pushing the swelling up the rectum, and using emollients or even the warm bath. Mr. Horsburgh, in cases where the disposition to spasm in the sphincter is associated with high irritability in the bowels, recommending the introduction of a metallic bougie for a certain length of time, the size of the instrument and frequency of repetition of the operation being daily regulated.—(*On Diseases of the Lower Intestines, &c. p. 154, et. 2.*) When the disease is in a state of inflammation, leeches applied to the vicinity of the sides, and puncturing the dilated hemorrhoidal vessels with a lancet, for the purpose of taking away blood, and the application of cold lotions, are measures occasionally employed to procure cure. The treatment of leeches was particularly recommended by Deschamps.—(*De Morbis Recti, Schreyer, 8. 1, p. 167.*) Petit preferred the latter.

According to Mr. Horsburgh, when there is "discharge of hemorrhoids from the veins within the sphincter, with perhaps little or no external tumour, one of the best means of relief is the rectal bougie, regulated by the patient's feelings, and also by the protraction with which inflammation and consolidation take place."—(*On Diseases of the Lower Intestines, &c. p. 215, et. 3.*)

When the number and size of hemorrhoids are so considerable, as materially to obstruct the discharges of the bowels, when they are severely painful, and subject to profuse bleedings, when the patient is disabled from following his usual occupations, and when the above means afford insufficient relief, the surgeon should recommend their removal.

The excision of piles with the actual cautery and cauterium, as practised by the old surgeons, is now altogether relinquished. The only case ever followed in the present state of surgery is, either to cut the framework of a pair of hemorrhoids or knots, or to apply a tight ligature round their base, so as to cause them to slough away. If possible, the opportunity of doing either of these operations should always be taken when the disease is in a scabrous state.

When piles are to be cut off, and they are not sufficiently spastic, the patient must first strain, as it were, in order to make the remaining mass apparent. With the aid of a pair of dressing forceps, the skin covering the hemorrhoids is then to be separated from them with the knife, but not cut away, and the tumour is then held off with a vaseline, and is to be removed.

Solinger states, that cutting the skin is very essential, for any hemorrhoids which may arise, will then be more easily suppressed; and when there are several hemorrhoids, so to excise them, the loss of resistance about the anus will be less, and, of course, the blood will not be so liable to a correction of this sort, which is sometimes a very great affliction.

Previously to the performance of any operation, Mr. Abernethy endeavours to bring the patient into a more regular state, and takes care to clear them with any medicine found by experience to answer the purpose without inducing a continuance of irritation and swelling. "The bowel being cleared in this manner, no efforts need be exerted in evacuating the bowels, and the pain relieved by bathing with tepid water, the pain should be taken hold of with a double knot and removed with a pair of scissors. A protruded and hardened pile at the bowel may be removed in the same way; but I think it is best to make the history of the hemorrhoid the depth to which the action may extend is necessary. The venous mass by the knife resembling this, could then be joined at each extremity." The direction of the incision, both for the removal of piles, and that of the place, he says, should be longitudinal in the direction of the bowels. When there is a transverse fold of the lowest of considerable extent, he prefers taking away two elliptical portions in the long axis of the tumor.—(*See Abernethy's Surgical Works, vol. 3, p. 209.*)

As I have expressed in the former part of the work (*see Essay, Postscript, &c.*), Mr. Abernethy and I removed these extensive diseased folds about the time of the late, with great success. A. L. Petit followed the same practice (*Mal. Char. 2. 2, p. 134*) and more recently Mr. Kirby.—(*On the Hemorrhoidal Excision, Lond. 1817.*)

The late Mr. Ware published some remarks, the object of which is to prove, that when there are several hemorrhoids, the removal of one or two of the most painful of them, with a pair of scissors, will afford immediate relief.

The excision of piles is occasionally followed by dangerous bleeding, as is exemplified in a case related by Petit. A patient had some hemorrhoids, which were supposed to be external, while they were just beginning to protrude. Almost immediately after they had been cut off, the skin which had supported them was drawn towards the anus. An internal hemorrhage ensued, which could not be suppressed, and proved fatal in less than five hours. The rectum had come away, and all of blood, coagulated blood. Sir E. Home speaks of some instances within his knowledge, where, after the removal of internal piles with the knife, the bleeding continued till.—(*On Ulcers, p. 363.*)

If the bleeding should be troublesome, and proceed from vessels within the rectum, the best plan would be to distend the gut with a suitable piece of sponge, so as to make pressure on the wound. Cold should also be applied to the rectum and tail.

The removal of hemorrhoids with a ligature can generally be done with sufficient safety; but still when hemorrhoids, though they are not constant, are frequently protruded this method without any doubts, in other instances, he had reason to regret of having adopted it. A woman, in whom he had tied five hemorrhoids with narrow pedicles, which were tolerably strained for this operation, did not at first experience a great deal of pain. However, five hours afterwards, he was informed that she suffered violent rectal pains, which extended along the canal. She was tied four times without material relief. At last Petit tied the ligatures, which could not be loosened, in consequence of their being encased so deeply in the substance of the swollen parts. The pain very soon subsided. The ligatures had only been applied four or twenty hours, but the piles had become black, and the skin covering their bases was cut through. Petit did not remove them without the least effusion of blood.

Petit also relates a case in which a patient, after tying had some piles tied, and of symptoms resembling those which take place in cases of strangulated bowel, notwithstanding the ligatures had been cut, as in the foregoing instance. After these two cases, Petit abandoned the practice of tying hemorrhoids. Mr. Kirby has mentioned two cases proving the effects sometimes arising from the ligature of piles: in one of these examples, the patient's life was saved with great difficulty; and in the other the operation was followed by

between and don't.—(On the Treatment of certain acute Forms of Hemorrhoidal Enlargement, p. 1—3, Nov. Lond. 1857.)

Mr. Henshaw, who prefers the use of the ligature, observes, that in performing the operation, it is not necessary to take up all the tumour; but that, if there are five or six, the tying of two or three of the largest will generally produce such a change in the texture of the rest, as will secure the patient from any return of the disease. After the ligatures are detached, he discharges the Secretions and applies cool lotions.—17th *Journal of the Lower Intestines*, &c. p. 215, vol. 2.

I believe, on the whole, that it is best to remove hemorrhoids with a knife, except when they are situated high up the rectum, where the piles are of large size and likely to bleed profusely. If a tumour be situated almost entirely beyond removal, which can rarely happen, a ligature might be put round it close with the aid of a double ligature. When the base of the tumour, however, is large, doubts of being brought up easily, and the surgeon prefers tying it, he should pass a needle armed with a strong double ligature, through the root of the hemorrhoid, and to one part of the ligature firmly over one side of the swelling and the other over the opposite side. When the base of the tumour is narrow, and the ligature is preferred, the part only to tie at first, without passing a double ligature through its middle.

Old hemorrhoids, which have been repeatedly in a state of inflammation, at length acquire a considerable degree of hardness. The internal extremity of the tumour becomes thickened, loses its natural softness, and forms a kind of cyst which prevents the tumour from bursting and bleeding.—(See *Traité de la Clinique*, vol. 4, p. 72.) In the end, it becomes encased by a kind of fibrous discharge. Its secretion now becomes by the use of emollient applications; and its extension is independently necessary.—(See *Lectures on Pathology*, vol. 2, p. 236.)

Amputation has occasionally prevailed, that the bleeding from piles is of a sanguine or critical nature, an evacuation, by which some poison is excited, which

is thrown off from the body. Hence, many patients have been advised to submit to the pain and annoyance which this disease occasions, rather than seek a cure. If the fact, that some patients have lost health after their piles have been cured, be received as sufficient proof of the disease having had a salutary effect, the doctrine must remain fully established. But before this inference should be drawn, it ought to be known whether the frequency of the fact is such as to warrant the conclusion; for it is not so obvious that the removal of piles places the patient altogether beyond the reach of danger and alarm, and no one will deny, that such operation frequently leads to improvement of the health. Were a patient to appear to suffer from the sensation of an internal bleeding from piles, leeches and even cupping-glasses might be applied.

Consult *Prat. Medica Pathologica*, &c. 2. Collins, *Systema Chirurgiae Halensis*, t. 2, p. 165, ed. 1800. *Schäfer, de la Hémorrhoidaire*, &c. Larrey's *System of Surgery*, vol. 2. Ward, on the Treatment of Hemorrhoids. *Traité de Chirurgie, Médecine Hemorrhoidale*, 2 vol. Nov. Vindob. 1765. See *J. Esch's Obs. on Hemorrhoidal Enlargement*, ed. de Nov. Lond. 1805. T. Cooper, *Obs. on the Principal Diseases of the Rectum and Anus*, Nov. Lond. 1811. Schreger, *Chirurgische Vorlesungen*, &c. t. 1, p. 553, &c. Über tuberkulöse Excremente des Afterkanals, Nov. Nürnberg, 1811. John Kirby, *Obs. on the Treatment of certain acute Forms of Hemorrhoidal Enlargement*, Nov. Lond. 1817. Abernethy on Hemorrhoidal Diseases, in his *Surgical Works*, vol. 2, p. 251, &c. Larrey, *Pathologie Chir. t. 1*, p. 231, ed. 1805. Richter on die Krankheiten Gallens Aden, in *Aufgaben der Heilkunde*, Band 2, t. 6, p. 235, ed. 1802. W. Hey, *Prat. Obs. in Surgery*, p. 429, &c. ed. 2, Nov. Lond. 1816. Diss. der Ursachen, &c. t. 20, p. 431, &c. Nov. Paris, 1817. Mayhew, *On Hemorrhoids*, in *Tracts Analytiques de l'Académie Affection Hemorrhoidale, et Hemorrhoides*, Paris, 1820. W. Whyle, *Obs. on Structure of the Rectum*, &c. 3d ed. Nov. 1820. J. Henshaw on Diseases of the Lower Intestines and Anus, ed. 3, Nov. Lond. 1811. G. Calverton *Hemorrhoids*, &c. Nov. London, 1820.







A
DICTIONARY
OF
PRACTICAL SURGERY.



SURGICAL DICTIONARY.

H

HÆMIA. (From *haima*, blood, from its protruding form.) Singularly denominated, by the term *hemia*, a tumour, formed by the protrusion of some of the vessels of the abdomen, out of the cavity, into a kind of sac, composed of the peritoneum, which is pushed before them. However, there are certainly cases which will not be comprehended in this definition: either because the parts are not protruded at all, or because several are. It is only in two cases, first, the sac is watery; as, for example, when the hernia has been produced by the operation of great children or has been generated by a tumour of the abdominal parietes, or an abscess at a radical cure has been made with callosity. The sac is also sometimes rendered suppurative by laceration or ulceration. Sometimes, when occasionally protruded, are not included in the peritoneum, as the bladder and ovary: and when they are considerably distended, they draw after them the portion of peritoneum connected with them, which forms a sac into which other vessels may fall.

The hernia, however, which surgery has a duty to remove, is that which is properly speaking, only the result of pathological anatomy: that is to say, of actual corruption of the natural state of our organs, with such different diseases, which may depend upon a relaxation of texture, a displacement of functions, a relaxation of continuity, or a change of situation. It is from surgical pathology, that the most radical methods proceed, both, which making surgery is restricted, as defined, to so many varieties, each one, to which the art is indebted for the perfection of its operations.

There are indeed a certain number of surgical operations, for the purpose and safe execution of which more anatomical knowledge will suffice: but, in many others, the surgeon cannot proceed, himself assured, even though he be well acquainted with anatomy, unless he has previously studied the anatomical changes of position, and advantages of position, of which the parts are, which he is about to operate, are composed. If he has not this assistance is destructive upon all his plans, and consequently may destroy his patient, and thus his career, by a mistake, sometimes of a very serious and irreparable kind.

It is to be borne in mind, as a result of this study, it will be sufficient to take a view of the different species of hernia, and their various complications. As surgery, of course, would believe, that the intestine, singularly fixed in the right iliac, and the ovary bladder, situated at the bottom of the pelvis, could descend without being first, or considered as a displacement, as to pass through the abdominal ring, and descend even into the scrotum; that the same intestine, the ovary, could pass from the right iliac region to the scrotum, provided the right iliac artery was not fixed, and the right ovary could have been fixed protruded from the abdomen at the left abdominal ring, while the left ovary through the right one; that the liver, spleen, and lung could sometimes form the contents of a unilateral inguinal and femoral hernia; that the contents could escape half within the colon, and every at stake at the anus; that the contents could be forced through the diaphragm, and form a hernia within the chest; that the contents, or intestine, or both these parts together, could sometimes escape from the belly through the foramen ovale, or an anastomosis, even being caught in the diaphragm, such is under the human body, could suffer the same degree of strangulation, without the consent of the intestines being interrupted; lastly, that in certain circumstances, the intestine and contents could be in immediate contact with the testicle, within the tunica vaginalis, without the least laceration of the latter membrane. These and several other analogous facts (says Scarpa) are so numerous, that they would not be regarded as incredible, had they not been proved by anatomical observations on individuals affected with hernia: their possibility (repeats the experienced physician) would not even have been suspected, either by the anatomist or physiologist. (See Scarpa, *Traité des Hernies*, &c.)

The parts of the body, where hernia most frequently make their appearance, are the groin, the neck, the inguinal canal, and the upper and lower part of the thigh; they do also occur at every point of the anterior part of the abdomen, and there are several less common instances, in which hernia has even presented themselves at the foramen ovale, in the perineum, in the vagina; at the umbilical ring, &c.

The parts, which, by being drawn forth from the cavity in which they ought naturally to remain, mostly produce hernia, are either a portion of the intestine, or a part of the abdominal canal, or both together. But the stomach, the liver, spleen, uterus, ovary, bladder, &c. have been known to form the contents of some hernial masses. The small intestine is more frequently protruded than the large, and the liver more frequently than the spleen, in consequence of its greater proximity to the ring and crural arch. A part only of the contents of the tube is sometimes included in a hernia: the larger quantity may descend from a single fold in the whole movable portion of the coat. (See *Lamarcus on Ruptures*, p. 8, &c. 4.)

From these two circumstances of situation and contents, are derived all the different operations by which hernia may distinguished. If a portion of intestine alone forms the contents of the tumour, the case is called *enterocèle*; and if a piece of intestine only, externally; and if both intestine and contents contribute to the formation of the tumour, it is called an *exterior* hernia. When the contents of a hernia protrude at the abdominal ring, but only pass on here as the groin or femoral hernia, the case requires the name of *inguinal* hernia; but if the parts descend into the scrotum, it is called an *obscure* or *scrotal* hernia. The several or *femoral* hernia is the name given to that which takes place below Poupart's ligament. When the hernia protrudes at the navel, the case is termed by comparison of unobscured hernia; and external is the proper name to the scrotum, when it occurs at any other protuberance part of the front of the abdomen. The congenital hernia is a very particular case, in which the protruded vessels are not covered with a common hernial coat of peritoneum, but are lodged in the cavity of the tunica vaginalis, in contact with the testicle; and, as must be obvious, it is not raised, the hernia is generally, from its situation, or contents, but from the circumstance of its coming from the bow of birth.

When the protruded hernia is entirely in the sac, and subject of being readily put back into the abdomen, the case is termed a *reducible* hernia; and when they suffer no constriction, nor cannot be put back, owing to adhesion, or their large size in relation to the aperture through which they have to pass, the hernia is termed *irreducible*. An *intercostal* or *transversal* hernia, therefore, which we only cannot be reduced, but suffers constriction, so that, if a piece of

the pressure of the uterus and the pressure of one or several portions of the abdominal parietes. Indeed, hernias are seen occurring from the pressure caused by distension, in which one part of the abdominal parietes is more strongly contracted, and is made tauter while, from being cut, loose, or in a similar manner, becoming distended, causes an undue tension in one part, and so support to the distended part is lost. From a dist of both sides, with every considerable hernia, or even play upon both sides, as we have noticed a few instances, of the distension, and the tendency to support to the distended part, though there be not the best reason for supposing it to be a matter of the necessity. Various modes which offer different degrees, afford another proof of the same truth. Thus cancer is strong in a family and weak in others. One patient of our hospital, nearly cut, being capable of making any further reference to the pressure of the uterus, situated in the cavity of the pelvis, at length suffer those parts to give way.

With respect to the second proposition, that during the formation of a hernia, the increased force of all the abdominal parietes is, as it were, directed and concentrated against one particular point of the parietes, we see a proof of it in a fact that occurs in our observation every day. In order to observe ourselves of this, we need only notice what happens in individuals afflicted with hernia: if they cough, or sneeze, or make the slightest exertion, they instantly feel the strain at the swelling, increased, and labour to support the part with their hands. During the slightest efforts, which render the action larger, it is also indispensable, that the necessary is exhibited in the same proportion as the sensitive parietes. All the viscera have such a tendency to be displaced and carried towards the weakest part of the parietes of the abdomen, that even those which are naturally the most distensible, and are the most easily forced by the force of the pressure, are in fact here devoted into the hernia. Anatomical knowledge alone would never have led us to entertain a supposition of the possibility of these occurrences. Swifert and Palma have treated, in an excellent manner, the hernia, with a portion of the abdominal wall.—*Obs. Anat.* cap. 4; and *Nouv. Méthode de la Hernie* (Paris, 1780). Swifert, Cooper, and others have assigned the current in an internal hernia to the left side.—*De Hæm. Internis, in Hæm. Diap.* Chap. 10; *De Hæm. Internis, Anat. Pathol.* lib. 2, p. 28; *Observations de Hæm. Internis*, p. 5. Editors have seen the left side protrude at the right inguinal ring.—*Mémoire de Médecine*, t. 1, p. 173. It is proved by all these facts, that both systems are the most likely to be the most part of the parietes and neighbouring parts, are respectively liable to form hernia; and if even disfigurement reason happens without a considerable elongation of the parietes, large having their lower in their natural situation; how can we suppose that, that a more of intestine, pushed by down through the inguinal ring, does along with it the corresponding portion of the parietes? In order to explain this event, there is actually the supposition a partial relaxation of the hernia.—*From Practice of Medicine, par. 4, Scarpa, ed. in Thes.*, p. 37-41.

The same reason, which first produced the protrusion, is often of an ascending nature, as Mr. Lawrence has shown, are constantly tending to produce the hernia. The hernia becomes larger, in proportion as the pressure against the internal sac is increased, and more frequent. Hence, the great fact which it often creates in persons considerably pressing intestine outwards.—No instance of this is so proper as in the very remarkable instance of one patient in which it is noticed. Hence, the frequency of ventral hernia, and the possibility to cut one of a known hernia. The case of a hernia is likewise just dependent upon the frequency and situation of the opening through which the pressure appears. Hence, ventral hernia requires an actual protrusion, that some other hernia, or inguinal. The situation of the protrusion of the parietes is another cause of the distension of a hernia to a considerable size, while the situation and extension of the same having median hernia, in particular cases, as a check to the protrusion of the uterus, or in a distension of the abdomen, which are generally small. When the sac, after it has passed the parietes of the abdomen, is

situated among cellular, or adipose substance, it is pushed equally in all directions, and forms a nearly spherical tumour, being, however, generally rather flattened, and is inguinal and crural hernia. It protrudes through a canal, or is formed by distension, or is inguinal inguinal hernia, and even in those which have passed the ring, and are still confined by the strength of the parietes, cord. The freedom of the sac depends as it depends upon the situation, and then it is most of all, when the swelling becomes pyrexia. Large hernia of this kind often take place from the weakness of the parietes in directions preventing the hernia, and thus, at the last moment of the protrusion of a hernia of median location, the parietal parietes is displaced to the point where the hernia is free, but sometimes take place in quality, that the sac is forced upwards, and is confined by the contiguous parietes in a figure of more than three days standing. These abdominal hernia prevent the return of the sac into the abdomen, when the contents of the swelling are enlarged. The protrusion, which necessarily compounds the protruded system, generally retains the same size and delicate structure which characterizes that weakness in its natural situation. It is covered by other membranes, varying in thickness and structure, according to the part in which the swelling is formed, and depends the duration of the hernia, &c.—(See *Laws of the Hernia*, p. 28, Ac. ed. 4.)

Many interesting observations, in relation to hernia sacs, have been sufficiently explained by Cooper; and some of them are noticed in Mr. Lawrence's work. It is the cause which have produced the hernia, continues to operate, and further distends the parietes, as is proved by the strong adhesion to the transverse cord, the sac becomes thin by distension. It may give way partially by a kind of invagination, and thus become irregular in figure, presenting an appearance of small cysts, or secondary cavities. On the contrary, when the hernia does not adhere so strongly, and the mouth of the sac forms a thickened ring, the increased action of pressure may make the ring become, and a thick one will form at the new mouth of the sac. This process may be again repeated; and thus the sac presents one or more contractions, by which the protruded part may be compressed, and even invaginated. Inguinal and crural hernia are almost the only cases in which this occurrence can take place. When a hernia passes through a canal, a thickened ring may be formed at both orifices of the canal. If a hernia sac has been formed, and its mouth becomes thickened, a new protrusion may take place by the side of it: this may occur again. And thus we may have several contractions of two lateral cavities, or contractions of two or more secondary openings into one principal protrusion; or, the original opening cavity may be contracted, and form a small appendix to the subsequent protrusion.—(See *Laws of the Hernia*, p. 28; and *Cooper's Lectures on the Hernia*, &c. in *Series*.)

Hernia are more frequent on the right than on the left side of the body. This fact, as Mr. Lawrence has mentioned, does not depend on any disparity in size, between the apertures of the two sides, but must be referred to the varying form of the right side in those of the left which constitute the most powerful contour.—(See *Laws of the Hernia*, p. 28, ed. 4.) This subject has been particularly considered by Cooper.—(See *Anatomical and Surgical Treatise of the Hernia Abdominalis*, p. 20, Ac. 4th. Paris, 1813.)

The general situation of a hernia, which is noticed here, and the three strangulations, are as follows: In most of some part of the abdomen, most frequently descending out of the abdominal ring, or from just below Cooper's ligament, or else out of the external, and occasionally from various other situations, as will be presently explained. The swelling often inguinal suddenly, except in the circumstances above related, and if it is subject to a change of size, being smaller when the patient lies down on his back, and larger when he stands up, or holds his breath. It frequently disappears when pressed, and grows large again when the pressure is removed. Its size and position often is more after a meal, or when the patient is flaccid. In consequence of the unusual situation of the hernia, many patients with hernia are occasionally troubled with colic, constipation, and vomiting. Sometimes, however, the functions of the viscera seem to suffer little or no interruption.

Sometimes the contained part may be known by the symptoms. But, as Mr. Lawrence justly remarks, its discrimination is often difficult, and even impossible, when the hernia is not large and very tense. At, in cases of this description, the violent expressions and considerable changes in the figure and state of the thickened hernia are generally an affirmative standard for the hand.—(*Id.* *Lectures*, p. 92, et. 4.)

If the case be an aneurism, and the portion of intestine be small, the tumour is small, is compressible, but, though small, if the gut is distended with wind, inflated, or have any degree of tension made on it, it will be tense, resist the compression of the finger, and give pain upon being touched. On the contrary, if there is no intestine, and the tumour suffer no degree of inflammation, but the prolonged piece be of vital arterial supply, and the tissue of whatever size, the hernia will be soft, and so give no marked resistance to the touch; upon the patient's coughing, it will feel as if it were blown into, and, in general, it will be transitory only, and variable.—(*Id.*) A suppurative tumour it often makes with the word is ascending. An aneurism is also generally characterized by the universality of its surface and its elasticity.

If the hernia be an epiploic, or one of the omental kind, the tumour has a loose flabby, and a most unequal feel; it is in general perfectly indolent, is easily compressible, and (if in the stomach) it is compressible, and less round, than the swelling contained in the same situation by an intestinal tumour; and, if the quantity be large, and the patient asleep, it is, in some measure, distinguishable by its gentle weight. In very young subjects, the absence of a hernia is generally brooding; and that admits sometimes.—(*Id.* *Caput*, *Lectures*, vol. 2, p. 3.)

If the case be a retro-saphenous, flatly, and consisting of both intestine and omentum, the characteristic may be less clear than in either of the simple cases; but the disease may easily be distinguished from every other one, by the body in the habit of marking the circumference.—(*Id.* *Id.* p. 25.)

As the smooth slippery surface of the intestine generally makes it subject to slide out of the os cruris, we may infer, says Mr. Lawrence, "that if a portion of the contents slip quickly and with noise, leaving behind something which is less easily reduced, the case is probably an entero-epiploic."—(*Id.* *Id.* vol. 4, p. 47.)

On the subject of prognosis, Mr. Port remarks, that the age and constitution of the subject, the date of the disease, its being free or not free from inflammation, the symptoms which attend it, and the possibility or impossibility of its being reducible, necessarily produce much variety.

If the subject be an infant, the case is not often attended with much difficulty or hazard, the reduction being easy as well as the disease; and though often neglected, or trifled with, the lower way falls upon again, yet it is easily reduced, and attended without mischief. Mr. Port says seldom, because he has seen an infant, one year old, die of a strangulated hernia, which had not been down two days, with all the symptoms of mortified intestine. For other examples of mortal hernia in very young infants, refer to *Groch's Case*, *Hist.*, vol. 2, p. 21; *Laurance's Rupture*, p. 27, *Ann. 4*; *Edin. Med. and Surg. Journal*, vol. 3, p. 20, &c.

"If the patient be adult, and in the vigour of life, the consequences of neglect, or of bad treatment, are more to be feared than at any other time; the symptoms are obscure, and more trifling. The great and principal mischief to be apprehended, in an intestinal hernia, is an inflammation of the gut, and the obstruction to the passage of the aliment and feces through it, which inflammation and obstruction are generally produced by a stricture within the intestine. In very old people, the symptoms do not usually make such rapid progress, both on account of the laxity of their fibres, and their more frequent circulations; and also because their organs are most frequently of smaller size, and the passage is more easily dilated; but then, on the other hand, it should also be remembered, that they are by no means exempt from inflammatory symptoms; and that if such should render the activity of old organs so favourable circumstances in the treatment, which may become necessary."—(*Id.*)

If the disease be recent, and the patient young, im-

mediate reduction, and constant care to prevent its protrusion, are the only means which it is possible to obtain a perfect cure.

"If the disease be long-standing, has been neglected, or reduced to be frequently done, and has got so far as to make the aperture in the abdominal membrane the neck of the hernial sac, that neck is permanent, is large, which circumstances in general render the reduction less necessary and less likely to succeed; and also indicate all measures calculated to prevent it for the contrary, if the patient be young, or, though old, but generally less kept up, no immediate reduction is made absolutely necessary, as the risk of returning is greater from the supposed weakness of the aperture, and the progress of the age. If the tumour be very large and ancient, distinguished by induration, and also the effect in the system generally, and if other inconveniences be added to several, it may be necessary to attempt reduction, as it will be almost impossible to make judiciously proper medicine, and the bearing of the patient, in the attempt, may so irritate and excite them as to be mischief."

With respect to the continuance of the disease, and delivered, some death may be expected, though it would certainly not be right to prevent all attempts at reduction, so as to do nothing; it must be equally wrong to make no trial, without the hernia reducible or not; and if reducible, I should not, as it tends to be reduced without delay, and when applied. This opinion, however, seems to agree with the judgment delivered by Port in another place, it can be seen in the next section of this article.

With regard to the contents of a hernia, Mr. Port observes, that "if it be a portion of intestine only, and has been gradually formed, it seldom occasions much distress, though its weight will sometimes render it very troublesome. But if it be pushed suddenly, by effort or violence, that it is a considerable piece of the coil by accident displaced at once, it will sometimes prove painful, and cause very disagreeable constriction; the constriction between the intestine and the neck, stands out, and being such as to produce the sudden descent of a large piece of the first coiled part of the intestine, emitting, cold, and as the disagreeable symptoms arising from the distention of these vessels. When the piece of mass stopped is such a degree of intestine as to prevent the passage of blood through it, it will sometimes, by becoming gangrenous, be the occasion of very bad symptoms, and even to death; as I have seen this case occur, and thus, in a more ancient hernia, it may sometimes be subject to great hazard. But even though it should never be liable to the aforementioned evil, still, as it, though the portion of the coil should remain unimpeded in the scrotum, yet it renders the patient constantly liable to hazard from active matter; it makes every moment possible for a piece of intestine to slip into the same sac, and thereby add to the case of the trouble, and all the finger-making stress an intestinal rupture. It is by no means an uncommon thing that a piece of gut be added as a rupture, which had in many years been gently curbed, and for that point be strangulated, and require immediate cure."

"An old intestinal hernia is often removed, and reduced, more by gradualness than to the view of the prolonged piece of cord, then by its weight. It is very common for this part of the intestine, which passes through the neck of the coil to be compressed into a hard, smooth body, and of appearance of cord, while when it is loose in the intestine it has an irregular, and refers to natural shape; in this constriction is often produced, from the cord being in the part; and it is often seen sometimes that in old ruptures, the first, that I have witnessed, that for long months ruptured, rendered insensible by induration, being such because in this the circumference was small."

"In the case of old intestinal ruptures, which have long been down, and very frequently by a bag there is too very uncommon thing to have a pretty considerable quantity of fluid collected; this, as collected fluid and circumstances of the disease, is of different kinds and quantities, and seldom so much as appears in the section any particular attention to it; but, as Mr. Port says, it sometimes is so much as to occasion the

have been than could have been expected, but it was, in order to remove the inflammation arising from the weight and the distention of the viscera, which I have also seen become gangrenous by the violent inflammation.

"If the hernia is of the ventral kind, rarely, and the patient is not so much, we seek in general, stronger means to keep the bowels open in this case, and even production of vomiting when it has happened; for the cause of the pain is the gas which is expelled, the liquid the mucus, blood, and the more abundant in the vomitings. I have seen a fatal gangrene in a woman, which had not been noticed forty-eight hours, and it broke out just as expected, and this more than fifty years back."

Another observation made by Pott is, that "if the hernia is caused by a rupture in the intestines, then, it is in general more painful, than if a part of the viscera has descended without which will also require more address and more pain in the treatment. The reduction of a strangulated hernia by digital pressure will always prove more practicable than that of a more considerable, after it has assumed to a certain size and state, as the part contained within the former is liable to use almost at once also than within the latter, which duration has already been mentioned, or to undergo a kind of necrosis of the parts of the small and large intestines."

"Not that the parts within a more spiritual hernia are absolutely exempt from such an attack as may render their return into the belly impracticable, even when there is no stricture, for (says Pott) I have seen that part of the testis which has laid long to the neck of the sac of an old rupture, so considerably hardened and thickened, as to prove an insuperable obstacle to its reduction."

Upon the whole, we rather infer, that an intestinal rupture is subject to more symptoms, and a greater degree of danger, than an external one, though the latter is, by no means, exempt of either as it is a common mistake to say that had symptoms are more likely to attend a rupture internal, than one of external date, than the descent of a very small piece of intestine is more dangerous than that of a larger; and that the hernia, which consists of gut only, is in general attended with more consequence, than that which is made up of both gut and coat.—(See also *Lectures on Surgery*, p. 76, 77, et c.)

So, they coincide with Pott, in thinking the pain to be more considerable when the content is small. "I think it is not a bad general rule, that the smaller the hernia, the less time there is of treating it by the taxis. Long continued efforts to reduce a prolapsed intestine, are most likely to succeed in old and large hernia, where an adhesion has taken place."—(Ibid. *Lectures on Surgery*, p. 20.)

It is correctly remarked by Mr. Lawrence, that "the danger is greatest, when a rupture is accompanied at the moment of its formation. Hernia, which arises spontaneously, and slowly from predisposing causes, seldom become complicated. The intestine, in such cases, is never clasp, nor are the symptoms violent, because the parts concerned are weak and relaxed."

"The opening through which the parts protrude in hernia is more difficult than in others; the pressure of the contents which they have to pass, and the danger of the patient more urgent. The aperture is generally very small in femoral hernia; the kind of rupture is less, and the consequences are more fatal, particularly in the elderly. On the other hand, general, inguinal, and ventral ruptures are more dangerous than the former, external, or vaginal kinds."—(Treatise on Hernia, p. 124.)

CRAMPTON ON A HERNIA CAUSED BY EASY AND IMMEDIATE REMISSION, AND NOT ATTENDED WITH ANY TENDENCY TO A NEW STRUCTURE.

"This case," says Pott, "is very frequently met with in infants, and sometimes in adults, and is the only exception to both. In this kind, the descent, getting dangerous, but after the usual efforts to cry, and the gut is either easily put off, or returns and again, as soon as the child becomes quiet, it then is either easily repositioned, or we are obliged to resort to surgery by a forcible push or pull in the sac, and which, being subjected to such pressure, lays the foundation for future trouble and mischief."

"This is in great conformity with a common

opinion, that a strangulated infant were a steel trap; a generally spreading view, and which ought to be corrected. The time is so long in which such cases may not be more, or might not be applied, it is, when well made and properly put on, not only perfectly safe and easy, but the only kind of bandage that can be depended upon; and as a critical case depends greatly on the thickness of the hernial sac, and on being capable of being so compressed as possibly to allow, and thereby entirely close the passage from the body, it must therefore, appear in every case to be well given, however the trouble of thinking on the subject, that the father have the parts been made a descent, and the mother and nurse the danger of the persistence in the pressure the probability of such case must be.

"The usual method of acting must, for the same reason, depend in every case, it is a radical cure may reasonably be expected; that is, the prolapsed parts cannot be so soon returned, nor so carefully prevented from falling down again; every new descent renders a cure both more distant and more uncertain."

"As soon as the patient is returned, the time should be immediately put on, and when without sensation, care being taken, especially if the patient be an infant, to keep the parts upon which a pressure constantly washed, to prevent rotting."

"It is certainly necessary to say, that the surgeon should be careful to see that the hernia, as his success and reputation depend on such care. A truss which does not press enough to ward off the return of all, as it occasions loss of time, and destroys the patient of the hernia; and one which presses too much, or as an unwholesome part, gives pain and trouble, by producing an inflammation and swelling of the spermatic cord, and inflammation of the testicle."

"In such, where ruptures are of long standing, and accompanied by frequent descent, the hernial sac is generally firm and thick, and the aperture in the junction of the diaphragm muscle, large; the fundus and neck with which the parts enter into the belly when the patient is in an erect posture, and the little pain which attends a rupture of this kind, often renders the patient very labour under it various; but all such should be informed, that they are in constant danger of such symptoms their complaint, as may put them into great hazard, and perhaps destroy them. The passage from the belly must open, the quantity of intestine in the hernial sac is always liable to be inflamed, and, when it is so, it is bound by a stricture. The inflammation of this portion of the gut which is down, or such obstruction in it as may direct and enlarge it, may at all times produce such complications as may put the life of the patient in the most danger; and therefore, notwithstanding this kind of hernia may have been known for a great length of time, without having passed under complications or hazards, yet as it is always possible to become so, and that very suddenly, it is never to be prudent or safe to neglect it."

"Even though the rupture should be of the ventral kind, which considered abstractedly is not subject to that danger or kind of danger in which the intestines are liable to be so much, or by accident, the cause of it may be the same mischief; but while it keeps the mouth of the hernial sac open, it renders the descent of a piece of intestine always possible, and consequently always likely to produce the mischief which may proceed from thence."

"They who labour under a hernia that diminishes, that is, where ruptures have been generally down while they have been in an erect posture, and which have either gone up of themselves, or have been easily put up in a placid case, should be particularly careful to keep them from cool winds, and properly fitted for the mouth of the gut, and the opening in the diaphragm being well kept up, and the parts having been sent to descend through it, if the pad of the truss be not pushed up, and there be no other degree of difficulty in the spine, a piece of intestine will, in some posture, slip down behind it, and under the same production of that very kind of mischief which is sought to prevent."—(Ibid. *Tracts*.)

"This accident, so justly deprecated by Mr. Pott, is not uncommon, but, reasonably so, if the rupture pad of the truss be not fitted for the mouth of the gut, as he directs in this pamphlet. For if the internal surface of the pad be convex, as was formerly universal, and thought judiciously, and as indeed Mr. Pott

plandy is certain. It is so stated that a "piece of intestine should slip down behind it," because the pad is "fixed by the action of the sun," and the "opening in the tendon" is thereby made larger and more lax by the instrument itself, and the facility increased to a recurrence of the accident.

If on the contrary the rupture pad be centred on its internal surface, and stay by its own elastic resistance, directed to close the mouth of the sac, instead of opening it as it does when centred, this accident, or recurrence, and so often fatal, could not happen. This is an obvious improvement; but this is not a sufficient reason for its being passed over in silence by Dr. Cooper. See now on the article *Truss*—*Roller*.

Mr. Pott then comments upon the importance of having the parts completely exposed before the truss is applied, and upon the danger that may be incurred by laying such knowledge aside after it has been won some time; "there the natural closure of the ring, whereby the descent of the gut is rendered less easy, will also make the reduction more difficult, if a piece should happen to slip down;" and hence he insists, that a truss "should be long and successfully worn by all those whose cure of the disease the expectations of a perfect cure necessitate, many of the registered (white) being obliged to the slightest manner in which children in school are suffered to wear their trusses."

Beware the danger of strangulation, and the loss of all chance of a radical cure; when a scissile hernia is neglected, and allowed to remain down, there are other motives for keeping up the truss with a view, and preventing its increase or cure. The chief vice to which neglected hernia sometimes becomes, not only prohibits all active exercise, but, by preventing, in the male, the integuments of the penis, transmits the infection from the act of cohabitation, and gives rise to mortification from the discharge of the urine over the swelling. Probably, too, the truss may be affected by the pressure of a very large scissile hernia.—*Albergozzi de Caus. et Sym. p. 33, art. 12. Schenckius, Fernelius, Cyr. Schlegel, &c. p. 185.* Disorders of the internal functions inevitably attend these large ruptures, and increase in frequency and violence in proportion to the size of the swelling, and age of the patient. All the movable viscera of the abdomen gradually find their way into the hernial sac, as a rupture is entirely neglected.—(*Lectures on Diseases, p. 85, p. 4.*)

TREATMENT OF SCISSILE HERNIA, FROM DEGENERATION, AND CHARGED WITH TROUBLESOME OR DANGEROUS SYMPTOMS.

Mr. Pott, and all the best writers on ruptures, assume the incapacity of reduction, in most cases, either to the largeness of the quantity of the contents, an attending pain in their size and nature, or to adhesions, which they have contracted with each other or their containing bag. The reduction is also sometimes prevented by transverse tendinous bands within the sac.

Mr. Pott was also aware that ruptures are sometimes rendered difficult to be reduced, by the organs being contained in the hernial sac. Of this fact he was as much convinced, as the nature of such kind of things would permit. This is, by observations made both on the living and the dead. This statement, made by Pott many years back, deserves particular notice, because in truth is confirmed by the modern observations of Scarpa, whose very important explanations of the causes and difficulty of reduction, may be seen in the last edition of the *First Lines of Surgery*.

Mr. Pott has admitted to the kind of impediment to reduction, produced by the tumescence of the neck of the sac, when the hernia is long neglected, and suffered to remain in the scissile without any bandage to support it.

The same surface becomes an absorption produced by time, and coated thick with gelatinous matter, in the form and consistency, or texture of the contents, as an infrequent cause why neglected scissile ruptures become irreducible.

When a portion of omentum "has been suffered to remain for a great length of time in the scissure, without having ever been returned into the belly, it often happens, that although that part of it which is in the lower part of the hernial sac preserves its natural soft, adipose, elastic state, yet all that part which passes through what is called the neck of the sac is by constant pressure, coated with hard, thin, lacrymiferous,

corneous kind of body, incapable of being expanded, and taking the form of the passage, at which it is retained, exactly filling that passage, and rendering it impossible to push up the lower part, and reduce the contents."

The same process for incapacity of reduction is also sometimes met with in ruptures of the testicular kind, from an adherent parietal and/or part of the tunica, which has been supposed to be open for a great length of time in the neck of an old hernial sac.

The other impediment, which I mentioned, took place of old ruptures, at the contraction and swelling of the parts, either with each other, or with the bag containing them. This is common to both the scissile and the scissile hernia, and is produced by tight adhesions of the parts, which have been permitted to remain in contact with each other, or perhaps in contact from the mere contact only. These adhesions are more or less firm in different cases, but in the slightest will almost always be found an insuperable barrier to the reduction of the internal part, or the total sac.

Many, or perhaps most, of these hernial ruptures, become so by some time and neglect, and which at first have been reduced. But when they are reduced to this state, they are capable of no more than temporary application of a temporary bag, to prevent, or delay the inconvenience arising from the weight of the contents.

People in this situation should be particularly careful and to make any attempts beyond what is enough to keep at state of agility; they should take care to avoid the loaded or strained state, and to keep it out of the way of all labour, dress, pressure, &c. What is done is very easy, a soft quilted truss should be put on the bottom of the ruptured part, to prevent extension, and the truss should be frequently washed by the same patient, a bag of this kind, and in such circumstances, being sometimes of the utmost importance. They ought also to be particularly careful of the office of the internal organ, when that they drive by any irregularity of diet disorder it, and give themselves from being costive." Mr. Pott states, however, that the quiet, indolent state of scissile hernia is by no means to be depended upon; that things may happen to it by which it may become, as to increase in size, and even form adhesions of that part of the gut which is contained in the neck of the passage of the stomach and through it, a stricture made by the abdominal bands, even so what has been long down, or so a new portion which may at any time be added to it, are almost equal to it in showing the state of the case, as if the gut itself is in a painful state.

Indeed, the hazard arising from a rupture made in a piece of intestine, contained in the neck of a scissile hernia, is in one respect greater, than the attending one, that has been forced at some distance from the nature of the case it will hardly admit of any attempt towards relief, but the operation, when in these circumstances, must necessarily be attended with additional difficulty.

Among the ruptures which have been thought to be reducible, and treated as such, there have been some which, upon severe judicious and even patient attempts, have been found capable of reduction.

When this is suspected to be the case, the most method is by steady rest, in a supine posture on a considerable length of time, by gentle distension and the use of cathartics, so as to loosen the contents of the hernial sac, and to reduce them to the point of pushing back up into the belly.—(*First Lines of Surgery*).

There is likewise given an account of a man, who was originally cured of a rupture of the neck of the sac by six months' confinement in bed.—(*Crab. &c. p. 41*).

Let Edward Atwood relate a mention of several instances, which distinguished either by what the ruptured hernia had been treated to bed, and in some cases examined by Scarpa himself. Some of the instances have induced this species of rupture, and by frequent distensions, and repeated pressure, have produced or increased the size of the hernia, and it was then returned into the abdomen. Mr. Hays would have succeeded in this way.—(*P. 214*). But, if the causes prove substantial, when the rupture is long and old, or in the peritoneum, just within the hernial sac, the greatest objection to this method of cure is the want of an absolute criterion for distinguishing

when the parts do or do not adhere in the hernial sac, and, in advanced years, though one were sure that the viscera were not from the sac, the possibility of having the body, by the necessary operations, is also another objection.—(May's Clinical Surgery, p. 15.)

When the parts are thought ready to slide, keeping up a constant pressure on the tumour, by means of a temporary bandage, until it has time to heal, would be proper for promoting the absorption of the thickened parts by the hernial sac. Dr. A. Cooper has induced such results, after applying air to them; the great object of which is to expulse its producing a contraction of the viscera, and thus a strong and permanent compression of the tumour. Mr. Earl has succeeded in the impossibility of keeping up a general pressure on the swelling, by means of a bladder containing quinine, the quantity of which can be regulated according to circumstances.

Whatever any attempts of this kind succeed, a truss should be immediately put on, and worn without relaxation.

However, there are instances on record where the capacity of the abdomen had begun to diminish in the diminished quantity of the viscera, and when the contents of the lungs were injured, without complete cure from their contraction into the belly. In such cases, met with several such cases, in which he was obliged to take off the truss again. That has shown the possibility of a hernia of this kind passing final, the parts not descending again when the truss was removed, the viscera and vessels contracting, and preventing their return.—(Chirurgische Wahrnehmungen, vol. 3, p. 312; Medico-Chir. 1.2, p. 313.)

Mr. West remarks, that "an essential rupture, which has been so long in the system as to have become irreparable, is very seldom attended with any suppuration, considered absolutely; but it is constantly capable of being an occasion of an essential inflammation, and all its consequences; neither is it at all for the most part, cured, neither as time and nature, as is considered as to be capable of resolution, may be resolved in time, and what become phlegmatic, or organic, and the removal of a great deal of trouble." In a few instances, suppuration produced very bad symptoms indeed, cases of which are to be found in Gumpert, Bismuth, &c.

Sometimes, in old cases of enteric epiphora, the intestine is perforated, but the contents do not. In which case sometimes air is blowing up the part of bowel with a truss, the part of which must be so constructed as not to press on the intestines. Mr. Pott however, considers this method not often practicable, and should such a truss be used, he recommends great caution in its construction and application, not a small piece of gut, or wax, but being joined on by the truss, produce little mischief.

Irreducible hernia near of course be exposed to all the consequences of external injury and violence; hence, various cases are recorded in which the bowels have been burst by blows, falls, &c.—(Lewence on Hernia, p. 126, note 4.)

For instances of such accidents, Mr. Lawrence refers to A. Cooper on Hernia, part 1, Prof. p. 2; and to Trauma's by one the Forces of Nature, &c. p. 20. A case is recorded in this Hospital, p. 318, where a violent swelling caused a sudden return of a hernia which had been long supposed to be cured. The violent inflammation, which was borne to the point of suppuration.

SYMPTOMS AND TREATMENT OF A STRANGULATED, OR AN INFLAMMATORY HERNIA.—SEEMS TO BE THE MOST DANGEROUS AFFECTION.

"Difficulty of reduction" says Ross, may be owing to several causes. The use of the power of suction, on the inflamed part of the intestine, is a violent and necessary; so inflammation of the gut, or its distention by feces or wind; or the swelling of the membrane of the intestine, through which the contents pass. But in whatever cause it is owing, if the protruded body cannot be immediately reduced, and the patient without pain, it is attended thickly homogenized matter, it is called an irreducible hernia, a strangulated hernia, or a hernia with stricture.

"The symptoms are a swelling in the groin or scrotum, pointing the impression of the finger; if the hernia be of the scrotal kind, it is generally painful

to the touch, and the pain is increased by coughing, sneezing, or making efforts. There are also very hot symptoms, and, if they are not relieved, are also followed by others, viz. a sickness at the stomach, a frequent vomiting is sometimes to vomit, a passage of all the feces per anum, attended with a frequent hard and painful state of the bowels.

A patient thus circumstanced is in great danger, and demands symptomatic assistance. A stricture exists in the protruded part of the gut by the aperture through which it passes, in the immediate cause of all the bad symptoms, and of course the removal of such stricture is the only thing which can bring relief. This object can only be accomplished by separating the bowel back into the abdomen, or by tying the parts which form the stricture. This former plan is always the most desirable, when practicable.

We may proceed to notice the various methods to be adopted for the relief of a strangulated hernia, so as to obtain the best chance of doing away the necessity of an operation. After treating of the various methods, a few remarks will be offered on the order in which the treatment should be put in practice.

First.—This is the first step to be taken in the treatment of a hernia with the hand. It is much promoted by the position of the body, which, whenever thought should be placed on an inclined plane and the thigh bent towards the trunk. Dr. A. Cooper advises the same practice, observing that this posture by relaxing the fibres of the thigh, relaxes also the aperture through which the hernia passes. Every degree of tension and relaxation of the femoral duct, must necessarily be attended with a corresponding change in the abdominal cavity. But degree of the thigh, besides relaxing this duct, also relaxes the abdominal internal liver, and pons muscles. In cases of inguinal hernia, the pressure made on the mass by the hands of the surgeon, should always be directed upwards and downwards, along the course of the spermatic cord; and Dr. A. Cooper advises it to be continued above a quarter of an hour.—(The Treatment and Operation of Hernia, &c.)

As the femoral hernia passes downwards and then forwards, the pressure must be directed first backwards and then upwards. In scrotal and ventral hernia it is to be made equally backwards. No clothes should ever be used, for, besides being irritating, it greatly aggravates the inflamed state of the contents of the hernial sac, and has been known even to burst the intestine.—(See Cooper on Inguinal Hernia, &c. p. 23.)

Besides bending the thigh, care should also be taken to make it steady, which will have great effect in relaxing the femoral duct, and tenders of the external oblique muscle. Suspension of the patient over the shoulder of an assistant has been thought to facilitate reduction; but have tried it often says Mr. Ross, but have not found it to be of much superior efficacy to some authors have represented.—(P. 144.)

The treatment of gently pulling the intestine downwards, or a little way further out of the ring, previously to the attempt to reduce the hernia, has been suggested.

—(See Ross's New Method of the Treatment of Hernia, &c. Part. Jones, Nov. 1824.) This plan, I believe, is not exactly new, and it is noticed by Mr. Lawrence; who says, that a half an hour's rest, when the difficulty of reduction is owing to an inflammation of local matter.

The removal of a piece of intestine is generally produced by a local cause, caused by the passage of air through the intestine. In scrotal and ventral hernia, and then in inguinal. The symptoms point up next to the very last position, which must be actually pushed through the aperture. If the hernia should not succeed at first, it will afterwards alter the worst, such, bleeding, or suppuration. Small hernia, being attended with the least tension, the most difficult to reduce, and, for the same reason, great attention to be often paid to the time, as inguinal hernia is the most subject. The time becomes less likely to succeed, the longer the intestine remains here been seen, because adhesion is liable to form. Mr. Lawrence observes in 1824: "When the rupture becomes painful, you are no longer justified in proceeding to attempt at reduction by the hand. A sufficient pressure cannot now be obtained, and the force which is required only tends to increase the inflammation, and to hasten the approach of gangrene. At this period, the operation is required, and should be performed without

frequently is obtained, by the good effects of bleeding, purgative medicines, and opiate, and foodies applied to the belly. Mr. Lawrence has justly observed, "One system, as it very frequently happens, the aid of the surgeon is not required, until the complaint has lasted for some time; and of the various remedies with the typical use of which should be immediately resorted to, in circumstances will not admit of delay in the performance of less powerful remedies."—(P. 146, vol. 2.)

Every man who has seen much of hernia, will immediately recognize the propriety of the following antithesis of the experienced Mr. Hay.

"I can scarcely give a negative form to the necessity of an early recourse to the operation, as the most effectual method of preserving life in this dangerous disease. If Mr. Hay's opinion be true, that the operation, when performed in a proper manner, and in due time, does not prove the cause of death above than perhaps once in fifty times; it would undoubtedly preserve the lives of many, by performing it almost as soon as the disease is recognized, without attempting the dangerous by spending much time in the use of means which cannot be depended upon for success.

"I have twice seen third-stage hernia fatal in about twenty-four hours. In such cases, it is evident there is little time for delay. A physician, who is competent to perform the operation, is not perhaps consisted of all the intestine is at the point of being asphyxiated, or actually in a state of gangrene. The disease is one which he is, therefore, in making himself. But when the patient is brought to a point of time of using the best mode of treatment, I am satisfied that his success will be the greatest when the operation is not delayed. This, at least, has been my own experience. When I first turned upon the profession of surgery in the year 1811, the operation for the strangulated hernia had not been performed by any of the surgeons in Leeds. My seniors in the profession were very kind in affording me their assistance, in calling on this complaint when such cases occurred, but we considered the operation as the last resource, and an improper still less dangerous measure. My own dictatorial mode of practice, I lost three patients in five, upon whom the operation was performed. Having more experience of the efficacy of the disease, I made it my custom, when called to a patient who had laboured two or three days under the disease, to wait only about six hours, then I might try the effect of bleeding if this evaluation was not forbidden by some pressing circumstances of the case; and the relaxation, in this mode of practice, I lost about two patients in three, upon whom I operated. This comparison is drawn from cases nearly similar, leaving out of the account those cases in which a progress of the disease had taken place.

"I have now, at the time of writing this, performed the operation thirty-five times, and have often had occasion to lament, that I had performed it less late, but never that I had performed it too soon. There are some cases in which, that it is not advisable to lose any time in the trial of means to produce a reduction. The delay of a few hours may cut off all hope of success, when a speedy operation might have saved the life of the patient."—(P. 141, &c.)

To determine the exact moment, when to give up the trial of the preceding measures, and to have recourse to the operation, is certainly difficult; but, as we can doubt that it is generally better to operate too early, than too late.

All hernia, even, in general cases, liable to many causes, in inflammation, little or none should be allowed to the trial of any plan, and the operation should be done without the least delay. In such a situation, we have full time to try the effects of every thing or all body is secured. The symptoms, which could be given up, in finding moment in the operation, arise from an attack of inflammation in that part of the intestine contained in the hernial sac, and from its spreading into the abdominal cavity. It is so proper to this situation, that we ought to hope the performance of the operation. Dr. A. Cooper considers pain as pressing the body, and therefore, as a sign of inflammation which points out its immediate removal. He adds, "Indeed, there is scarcely any period of the symptoms, which should demand the operation; for, even if inflammation has partially begun, the operation may be the means of saving life, by preventing the study

operation of progressive parts."—(On Surgical and Congenital Hernia, p. 27.)

Whenever the surgeon has entered in finding the parts, without having recourse to the knife, if the symptoms of pain, inflammation, &c., can be kept under control, they will not always prove immediately afterward. As they probably depend on the reduced blood having been inflamed by the pressure, the body should be kept open, and the diet and regimen should be free and sparing, while the best chance of cure can be taken. In such a case, if all complaint is slowly removed from the abdomen, and the pressure in the groin free, and without trouble.—(P. 141.)

THE FIRST SYMPTOM IS A STRANGULATED HERNIA.

The earliest symptoms have been already given, viz. "pressure in the groin or scrotum, attended with pain, not only in the part, but all over the body, and swelling a swelling and distention of the abdomen, with some degree of fever." These are the first symptoms, and if they are not opposed by the return of the intestine; that is, if the attempts made for this purpose are not successful; the symptoms become more troublesome, the swelling more frequent, the pain more intense, the tension of the belly grows more feverish, and a general inflammation arises in which is very terrible to look. When the inflammation of the point, no time is to be lost; a very little delay is now of the utmost consequence; and if the one single remedy which the disease is now, cannot be so soon administered immediately, it will prevent the every other attempt. This remedy is the operation, whereby the parts engaged in the situation may be set free. If this be not now performed, the swelling is soon increased for a considerable time, and a frequent pulsing up of bilious matter, the tension of the body, the swelling, and fever being now considerably increased for a few hours, the patient gradually becomes perfectly free, the belly subsides, the pain, from having been fixed, felt, and constant, becomes less, languid, and generally intermittent in the skin, especially that of the trunk, and last but not least, the eyes have now a large and a glowing, a light being ready to be described; the tension of the part disappears, and the skin covering it sometimes shows the natural colour for a brief hour; but whether it be or does in colour it has an appearance that is peculiar to the flesh, which will easily be perceived by all who have attended this, but is a sign that it is nearly as dead as by words. This condition is the one in which strangulation is most common. In this case, the gut either goes up spontaneously, or it is drawn with the greatest degree of pressure; a swelling is made by study, and the patient is generally recovered at the end of the day; but this phenomenon should be time, for the surgeon and the rest of the family, and increasing, with the addition of symptoms upon the abdominal tenderness, the tragedy soon follows."—(P. 141.)

According to Sir Astley Cooper, one of the most common symptoms of a strangulated hernia is pain above the diaphragm, followed by constant vomiting. The patient is soon troubled with swelling and tenderness. He feels a great inclination to lie down, but cannot succeed in his attempts to rest the feet. There is some pain in the scrotum; and a great deal of the gut where the stricture is situated. Although the disease becomes considerably distended with air, and distension not arising in the first instance, but from the pressure being increased, he is asked by the nurse to be allowed to give in for any pain. The vomiting becomes more frequent, and the patient is often forced from the stomach, and when he is brought by water to the water, the patient is in the first stage. A dyspepsia will sometimes arise from a partial freedom of the gut, but the operation will be necessary. When the abdomen is in this state, but accompanied with pain, and when there is frequent vomiting of the mucus, the patient is not in the second, and very different, but, in the next stage of the symptoms, when the abdomen is not only free, but painful on being touched, the patient is extremely weak and feeble. The vomiting and excessive tenderness, and the patient is pale, and covered with a cold perspiration. The patient becomes very weak, thin, and is greatly a little inflamed on the surface of the skin.

With regard to the laceration which takes place, and which has recently been considered as a sign of the presence of gangrene, Mr. John Cooper declares, that it is not known, and he knows patients having had it for many years, and yet recovered after the operation. Hirsch says sometimes gangrene occurs several days after the latter proceeding, and, at the time, healing does more good than any other remedy.—(*See LANCET*, vol. 2, p. 123.)

ANATOMY OF UMBILICAL HERNIA.

This subject must necessarily precede the account of the operation, which would otherwise be unintelligible. It is chiefly in the anatomical information relative to hernia, and in the mode of operating, that modern surgeons have achieved superiority over their predecessors, for, before Lisfranc, Cooper, Hey, Lawrence, Cooper, Sharpey, Hirschbach, Langenbuch, and Cooper published their several works on hernia, the anatomy of the disease was but imperfectly understood.

The tendinous fibres of the aponeurosis of the external oblique muscle, as they run downwards and downwards towards the pubes, separate from each other so as to leave a triangular opening, called the abdominal ring, which is certainly more extensive in the male than in the female subject. The upper and lower pillar (as it is termed) of this aperture is composed into the symphysis of the pubes, and is the outlet of the inguinal canal, and water and vessels in the sheath, is chiefly a continuation of Poupart's ligament. *Langenbuch*, *Sharpey*, *Hey*, *Cooper*, *Lisfranc*, and *Hirschbach*, p. 4, and as far as the angle and crisis of the same bone. Some maintain there exists the separated outer angle of the ring, others as distinct the triangular aperture of the whole aperture; these are said to be very varying in all persons. The anterior and oblique line of the aponeurosis of the internal oblique muscle joins the tendons of the external oblique; the posterior and inferior part runs from the transverse arch, but the lower portion of this tendon, together with the corresponding part of the transverse, goes behind in front of the transverse muscle. Thus the latter border of the oblique inguinal and transverse, which originates from the upper part of Poupart's ligament, lies behind the outer pillar of the abdominal ring. Mr. A. Cooper did not consider that a third fascia proceeds from the lower edge of Poupart's ligament, and spreads over the posterior surface of the transverse muscle. This fascia forms the only partition between the peritoneum and the outer opening of the abdominal ring, and would be useful in evidence, against those who would probably be such more ignorant. The partition, in operation, however, is used by *Sharpey* to be formed by the aponeurosis of the internal oblique and transverse muscles, while *Langenbuch*, who has named the small muscle point situated directly behind the outer opening of the abdominal ring, its crural surface, distally placed, that it is formed by delicate fibres and transverse line of the internal oblique muscle (*Ueber die Hernie*, p. 4, *de Litteris* and *Schreibweise*, p. 4) and that behind this is the weakest part of what he terms the internal inguinal ligament, in the tract of which is the peritoneum, with the intervention of a very loose stratum, because—(*Op.* vol. 1, p. 58). The external inguinal ligament of *Langenbuch* is described as being the same thing as the above fascia joined, and by Mr. A. Cooper. The point of the statement is that of the three weak places in the inside of the inguinal region, either hernia was liable to occur, yet, weak as it appears to be, it is the most common situation of such tumors. A communication has been made, not in a hundred cases of inguinal hernia, but in some at the point last specified.—(*Dr. J. Deschamps, Des hernies, des Brûlés, de M. de la Roche*, 1811). Mr. Lawrence observes, that if we take the three communications from the vessel with epineurium, we shall find a divided lamina, and the peritoneum, an internal and external which have between them a considerable interval just in the middle of the stratum. The fibres of these, which is the strongest, and most decidedly fibrous, is connected by the lower edge of the outer margin of the rectus, and in the inferior margin of the tendon of the oblique inferior and transverse, and both are gradually lost above, between the peritoneum and transverse.—(*On Ruptures*, vol. 4, p. 123.)

The spermatic vessels, joined by the vasa deferens,

run in front of the epigastric artery, very near the place of its origin. They then pass through the above fascia, go under the edge of the external oblique and transverse muscles, and last obliquely downwards and forwards, between the above fascia and aponeurosis of the external oblique muscle, to the opening of the ring. When arrived on the smooth surface, immediately behind the ring, they describe an oblique angle, and pass upwards and downwards into the scrotum.—(*Langenbuch*, *op. cit.* p. 5.)

There is one point that the spermatic cord, before it actually enters at what is named the abdominal ring, runs through a kind of canal, in which the spermatic inguinal is often applied. The shape of the canal of the ring, through the abdominal partition, was well known to, and elegantly described by, Albinus; Gombert makes distinct mention of it in his account of a *Nerv. Abdom.* of opening for *Fluvius Hernia*, p. 12, 22; but the A. Cooper has the merit of having given the earliest correct account of the inguinal canal, in reference to hernia; a subject rendered complete by the more recent elucidations of *Langenbuch*, *Sharpey*, and *Langenbuch*.

The abdominal ring is then only the outer opening of the canal or passage, through which the spermatic cord passes before it enters. The manner, in which the vessels first pass, in the most common cases of inguinal hernia, is situated about an inch and a half from the abdominal ring, in the direction towards the superior external inguinal process of the ilium; or, according to *Langenbuch*, the inguinal canal is situated an inch and a half as length, the average distance of the outer pillar of the abdominal ring, from the lower pillar of what he terms the posterior ring, being about sixteen lines—(*Op.* vol. 1, p. 115). This lower opening is often termed the posterior ring, and its upper border is fixed by the lower edge of the external oblique and transverse muscles, which can be easily felt with the finger, introduced upward and carried into the abdominal ring.

The precise point at which the hernia most commonly issues, is the pubic arch, and the inguinal ligament, in the form, in the communication of the vessels inguinal with the peritoneum, and, in the adult, is the junction of the spermatic cord under the transverse muscle. In the second state, the peritoneum protrudes at this point a small funnel-like depression, the depth of which increases in proportion to the spermatic cord is pulled forth above downwards. It is this small pouch, this sort of digital appendage, whose progressive augmentation constitutes the hernial sac. Resting upon the anterior surface of the spermatic cord, it first makes its appearance under the inferior edge of the transverse muscle; thence it extends itself in the separation of the inferior fleshy fibres of the internal oblique muscle, always following the spermatic cord, in front of which it is situated, and after having, in this manner passed through the whole of the canal, which extends from the first region to the pubes, it lastly protrudes at its external orifice, which is the inguinal (or abdominal) ring, properly so called. In all new tumors, the hernial sac, as well as the spermatic cord, is situated above the femoral arch, the direction of which it follows. The tumor which is a tumor is of a conical shape, the apex of which is towards the flank, and the base in the external orifice of the ring.—(*Sharpey*, *Treatise*, by *James*, p. 44, 45.)

The spermatic artery, runs behind the spermatic cord, along the lower margin of the internal opening of the above point, then upwards and forwards, so as to pass at the junction of half an inch, or an inch, from the upper extremity of the outer opening, or abdominal ring.

In human cases of inguinal hernia, the uterus, protruded under the opening of the inguinal canal, is over the spermatic cord, and forms a tumor on the outside of the abdominal ring.

When the clitoris is very extensive, the above described digital process of the peritoneum, but do not protrude through the abdominal ring, the case is nevertheless treated as if it were a regular inguinal hernia, and complete when they pass out of this opening. The vessels may continue for a long while again, within the inguinal canal, and even become strangulated there; sometimes, also, they are prevented from passing farther towards the ring by a too kind of impediment; and, in the circumstance, in the literature, have any addition made

to its contents, it may expand between the external and internal oblique muscles, as Henslow has an opportunity of seeing in the body of a snake.—(Edinburgh Dispensary, &c. *See Lecture and Demonstration*, p. 285.) The distention may take place either at the internal or external opening of the inguinal canal. In most and usual hernia, according to Sir A. Cooper, the inguinal ring is most frequently situated in the lower opening, in large old persons, at the abdominal ring. Here, when the parts completely protrude out of the lower opening, the distention may exist at the other end; but this may occasionally be vice versa, viz. the distention existing at the upper opening.—(See *Lectures on Ruptures*, p. 163, *art. 2*.)

The hernial sac descends through the abdominal ring, over the spermatic cord, and is covered by a tunica, cut off from the body of the external oblique muscle. Beyond this fascia, the transverse muscle is situated, over the sac, which, after it has descended a certain way, becomes the internal inguinal, as well as the spermatic cord.

As the spermatic artery naturally runs first behind the spermatic cord, and then along the inner margin of the apertural opening of the ring, and as the vessels are projected over the cord, they must be situated on the outer side of the artery, which runs first behind the neck of the sac, and then on its inner side. Hence, the inner margin of the sac, when situated on the side towards the abdomen, seems to be formed, as it were, by the neck of the vessel.—(See *Lectures*, p. 178.) Thus this is the ordinary situation of the spermatic artery, in relation to the inguinal hernia, as testified by the constant testimony of Cooper, Elliot, Desault, &c. &c. See A. Cooper, Henslow, Scarpa, &c. and by preparation to be seen in almost every museum.

In recent inguinal hernia, the internal and external openings of the ring are at equal distance from each other, the first being situated slightly upwards and outwards in relation to the other; but the pressure of the protruded vessel gradually forces the apertural opening more towards the pectus and venter in the abdominal ring, so as to render the posterior side of the neck of the hernial sac, and of the inguinal canal, very short.—(Henslow, p. 28.) Thus, in large hernia of long standing, the spermatic artery becomes situated nearer the pectus than in the natural state.

Though this is the ordinary direction in which a hernia protrudes, there are occasional variations. In some of these the vessels, instead of descending through the apertural ring, are at once forced through the abdominal ring itself, and the opening into the body as they direct; the hernial sac, instead of passing to the external side of the spermatic vessels, as is usual, now lies outside them in the pectus; and the spermatic artery, which is commonly situated behind, here passes its course, in front of the sac, as its usual course from the vessel and outer margin of the abdominal ring.

The following is Scarpa's description of the displacement of the spermatic artery in the greater number of cases of inguinal hernia:—"This artery, which, in the natural state, runs about two lines from the abdominal ring, has no sheath and direction is changed, in subjects affected with hernia, thus it crosses the posterior part of the neck of the hernial sac, and is pushed from the outer to the inner side of the abdominal ring. In subjects who presented the recent or old displacement, it is necessary to consider what I have designated one of the inversions of inguinal hernia, and of the manner in which the spermatic cord crosses the spermatic artery. The hernia begins to form in the very place, where the spermatic cord passes under the inferior margin of the transverse muscle; and this place is rather near the flank, than that where the spermatic artery passes towards the rectus muscle." In its progressive extension, the hernial sac necessarily follows the same track as the spermatic cord, which is situated upon its anterior surface. As the sac already explained, this cord crosses the spermatic artery; consequently, the hernial sac must necessarily pass with the cord above this artery, before protruding from the canal of the abdominal ring. At the same time, the internal bottom of the hernia lying high up, and the inguinal canal obstructed by the inguinal ligament of its own nature to each other, it follows that at the point when the

hernia begins to make its appearance in the groin, the spermatic artery is unavoidably situated behind the neck in the hernial sac, and is pushed from the outer to the inner side of the ring. Let us suppose a piece of string to be passed from the inside of the abdomen into the scrotum, all through the inguinal canal, and the middle of the hernia; and that this string is pulled on so as to bring out the internal orifice of the hernia, which is situated beyond the point where the spermatic cord crosses the spermatic artery; this artery will necessarily be forced to be carried from the outer to the inner side of the neck of the hernial sac. The same thing happens from the effect of the contraction of the hernia. The removal of the spermatic artery, from one side of the ring to the other, (says Scarpa) is a phenomenon which may be regarded as a demonstration in the inguinal hernia. I have examined the bodies of a great number of subjects affected with the hernia of hernia, and it has been only in a very few that I met with the spermatic artery remaining in its usual situation on the outer side of the abdominal ring. In investigating the manner of this exception, I have observed, in all the individuals who presented it, a very remarkable weakness and looseness of that part of the abdominal parietes which extends from the flank to the pectus. In all, the displaced artery had passed through the spermatic cord of the transverse and internal oblique muscles; not in the vicinity of the ring, as is commonly the case, but at a little distance from the pectus, along to the upper part of the rectus abdominis that is extraordinary, and disproportionate to the weakness of the hernia. I observed also, that the neck of the inguinal sac did not pass to an oblique direction, from the flank to the pectus, but that it protruded from the abdomen almost in a straight line, as behind forwards. In short, in these subjects, the usual cut-de-vent of the peritoneum, which contains the right of the hernial sac, had not begun to be formed under the edge of the transverse muscle, at the point where the spermatic cord runs outwards; but had passed through the spermatic cord of the internal oblique and transverse muscles, at a little distance from the pectus, and under the point at which the spermatic cord crosses the spermatic artery. The same hernial sac, having at this particular time ended into and united to the spermatic cord, protruded at the posterior border of the inguinal canal, without displacing the spermatic artery from its natural situation.

This species of hernia, properly speaking, is a variation of the ventral and inguinal. It resembles the former, inasmuch as the hernial sac passes in the situation of the transverse and internal oblique muscles; the latter, inasmuch as it passes out of the abdominal ring, conjointly with the spermatic cord.—(Scarpa, *Prove della Hernia*, p. 68, &c.)

Henslow particularly adverts to a singular species to be seen on the inside of the inguinal ring: "The upper boundary of it is as formed by the outer lips of the osseous arches; the lower by the tubercle beneath of the os pectus; and the internal margin contiguous by the crural vein and spermatic artery. Now, says he, when it is considered, that this artery necessarily obliquely upwards, because the lower margin of the ring, and the above transverse space, are placed too low to know on which side of the neck of the hernia the artery must be in the two species of inguinal, as well as the crural hernia; for, in these kinds, when contiguous to the above (inguinal) space, the artery lies at the outer side of the neck of the hernial sac; while, in every hernia, that takes place through the posterior opening of the inguinal canal, the same vessel is removed to the inner side of the neck of the sac. These species of hernia, Henslow applies the epithet lateral; and in the other, internal, according to the situation of the point at which they are protruded. By Sir A. Cooper, they are named oblique and oval, which are also very proper terms. The internal or lateral hernia is much more frequent than the oblique, and is said to occur chiefly on the right than the left side of the body; a circumstance coinciding with another observation, viz. that, in children, the neck of the osseous arch is longer upon the right than the left side.

The circumstance of there being two forms of inguinal hernia strongly confirmed one desirable hypothesis; surgeons have, that the spermatic artery lay somewhat at the lower extremity of the ring, side of the neck

operation is successful in preventing a radical cure, that he advised (p. 195) the employment of every operation for strangulated hernia.—(*See Lectures on Surgery*, p. 243, vol. 4.)

If the adhesion should be at the inner opening of the canal in the inguineal ring, Mr. A. Cooper advises the operator to introduce his finger into the sac as far as the stricture, and then to introduce a probe-pointed bistoury, with the flat part of its blade turned towards the finger, between the front of the sac, and the abdominal ring, till it arrives under the stricture caused by the lower edge of the transversalis and oblique internus. Then the edge of the instrument is to be turned forwards, and the stricture cut in the direction of the probe. This plan of not cutting the neck of the sac is liable to all the objections stated by Mr. Larrey, and is, indeed, the case, in which the stricture takes place at the abdominal ring. Mr. A. Cooper's history is a very proper one for showing the stricture, as it only has a small edge in a certain distance from the point. Perhaps on the whole, we may infer, that it is better to cut early and judiciously to divide the neck of the sac, instead of stricture straining it to this position at the ring as it may be. The method of cutting the stricture from within forwards is manifestly objectionable, as the ground of the risk of wounding the sac is in this mode being greater than that of wounding from surrounding the epigastric artery, when it occurs in an individual position, and derives from its regular course—a reflection which has made Dr. Hesselbach, (after an allusion to the practice—*Chirurgische Vorlesungen*, 4te Auflage, 1819.)

When the stricture is at the upper opening of the inguinal canal, the ring should not be cut, unless it prevents the descent from causing the sac simply united stricture, as happened in a case recorded by Mr. Larrey.—(*See Surgery*, p. 241, vol. 4.)

Being being made by the protrusion of the protruded part from the abdomen by the division of the stricture, we are to be immediately raised, if we find ourselves in this position. This does not necessarily follow by holding the finger. The intention is to be raised before the operation, but when a person of consequence is protruded, it is to be returned before either of the preceding steps. The hernia should always be reduced, unless it is found in a state of actual strangulation. It often appears as if there is no strangulation, but an individual person would deem it improper to return it into the abdomen. However, if such a situation should be reduced to a real strangulation, extensive parties are involved of the part. Mr. A. Cooper has judiciously cautioned the operator not to divide the sac, but to divide the stricture from the sac of the stricture. With these the protruded part is frequently found affected, and as they generally produce no permanent mischief, they ought to be merely dissected from the sac, purple, or not colored with which usually people, strangulation. To determine whether a discolored portion of intestine be positively manifested more pronounced pressing forwards the blood contained in the veins; and if they do again, it is looked upon as a proof that the bowel is still possessed of life.

In making a point of inflection from the abdomen, the surgeon should not introduce the plan without the ring into the stricture, and hold it there till another point has been reached. While motion is to be continued till the whole of the protruded bowel is reduced.

The employment of force is violence in the middle, which is more the violence of a hernia in the operation, than in the operation itself; a method the more permanent because with parts are seen as well as a state of inflammation. It is always better to divide the stricture than to divide the sac, as the latter is liable to get into a state of inflammation which is not good. Dissection of the hernia sometimes prevents the reduction, and when this is the only method, the part may generally be returned as well as its contents have been compressed into the reduced ring within the stricture. It is better, however, to divide the stricture from the sac, than to divide the sac, as the latter is not the same both for the abdomen in the manner just suggested.

Reduction is sometimes beyond the protruded part following in with other or to be reduced. The stricture is not only divided very freely adherent to the sac. The contents and inside of the sac are the parts which are most subject to become inflamed.

connected by adhesions. The finger will commonly turn for looking any more after adhesion which may sometimes place between the intestine and the side of the bowel sac. When these adhesions are firm, and of long standing, they must be carefully divided with the knife; an object which can be most easily and safely accomplished, in case they are strong enough to prevent the intestine to be divided a little way from the surface of the sac. But protruding the finger and stricture keep the external end of the lower and front surface of the intestine in contact, the protruded case is capable of separating the parts with a knife, as in the case of separating the intestine. In doing this, the finger should not be withdrawn so far as to cut near the bowel, but rather to leave the posterior parts of the sac, and return them with the intestine into the abdomen. Every post-operative treatment should always be repeated before the stricture is reduced. Mr. A. Cooper mentions that a total obstruction in the presence of the intestine in the sac has arisen from the adhesion of the two sides of a small intestine together.—(p. 31.) When the adhesions which prevent reduction are situated about the neck of the sac, and not of the epigastric view, it is best to make the wound through the skin and abdominal ring somewhat larger, so as to be able to separate the adhesions with more safety.

Having reduced the parts, the operator should introduce his finger, the purpose of being sure that they are fairly and freely returned into the abdomen, and no longer suffer constriction, either from the inner opening, from the ring, or the point just within the cavity of the peritoneum.

Sometimes a strangulated hernia is complicated with a hydrocele, a circumstance which may render it necessary either to cut through the inner swelling, or to limit the incision into the hernia sac, according to the following happens to reduce the whole of the front of the sac, as seen by Mr. Cooper and Mr. Stanley, or merely to stricture in front of the lower part of the rupture.—(*See Lectures on Surgery*, p. 243, vol. 4.)

TREATMENT OF THE HERNIA.

In an extensive hernia, this part of the body and the sac, however, it is to be reduced after the intestine. When, however, it is much distended, thickened and indurated, and frequently is found to be after reducing the contents of the sac in a hernia, the protruded part should be cut off. Its reduction in the stricture should be highly improper, both because an immediate strangulation of the protruded portion is necessary, in order to be able to cut the discolored, worn back into the abdomen, and because, when reduced, it would, in all probability, cause inflammation of the internal parts, and bring on dangerous symptoms.—(*See Surgery*, p. 422.)

The divided circumference should always be cut off with a knife; and if any of the intestine should bleed, they ought to be taken up with a tenaculum, and tied separately with a weak ligature. An extraordinary impression of hemorrhage from the cut end of the intestine has led many operators to put a ligature above this part, just above the divided portion, which they were about to remove. This practice cannot be recommended in any case. As a frequent effect of it is to induce a fatal inflammation, and even strangulation of the intestine, extending within the abdomen, as high as the stomach and mammae, such as we collect. Mr. J. Cooper has remarked, with great truth, that in the stricture the system should ever be preserved. The very object of the operation is to remove the contents from the protruded part, leaving free the presence of the surrounding tissues, and no more has this been done, than the surgeon includes it in a ligature, which produces a more perfect constitution than that which existed before the operation was performed.

When the operation has suffered strangulation for a few days (says the Larrey), it often becomes of a dark red or black color, and there is an appearance, on cutting it, as if some blood were contained in its substance. This, I believe, is the state which surgeons have generally described under the term of gangrene.—(p. 322.)

When put in this state, it does not bleed. I need hardly observe, that the dead part must be removed, and never reduced. Some have advised leaving the

happened in a case related in the *Ann. de St. L.* (Ann. 1. 22. p. 262.—*Th. Lancet*, p. 264, col. 4.)

Instead of such results, Mr. Lawrence judiciously recommended dilating the gut, and leaving the abdominal progress of the cure entirely to nature. The strings will be cut off, and the ends of omentum removed by the adhesive process in a state of organization, each other, the most favorable for the operation. Thus, there is a chance of the continuity of the intestinal canal becoming established again.

Whatever experiments it may be advisable to make in wounds with gunshot and division of the large intestine, I think, it may more judiciously establish, than the difficulty and danger of attempting to suture the bowels in cases of hernia.

OPERATION FOR VERY LARGE INGUINAL HERNIA.

When the tumor is of long standing, exceedingly large, perhaps extending half way down to the knee, and its contents have been mistaken of being completely reduced, the laborious and delicate procedure, provided a strangulation takes place, but not thinking long upon the internal sac, or attempting to reduce the parts.

The reason against the common plan of operating with cold circumscissors, are, the difficulty of separating all the old adhesions; the laborious dissection which would be entailed by laying open, as was a lance, and the probability that pain, as long protracted, might even bring on various complications, as related. J. L. Petit, and afterwards Dr. Monro, observed that it was not to be performed.—(*Chir. 4. 2. p. 212. Description of some Cases*, 1788.) Mr. Lawrence recommends an incision, at two or three inches in length, to be made through the instruments over the abdominal ring. The fascia, covering the hernial sac, is first to be exposed by dissection, and an opening made in it. This will permit a proper direction to be put under the hernia, and the peritoneal cavity may be conducted, by means of the probe, to the part that requires division. If great difficulty should be experienced in accomplishing our object in this manner, a small aperture may be made in the sac near the ring, where the hernia may be drawn with ease. The parts, after being thus divided, should be returned into the belly, by means of the syringe, if adhesions be not present: it, at all events, they present, should of being repaired in part.—(*Lancet*, as *Appendix*, p. 269, col. 4.) A very interesting case has been recorded, in which the foregoing advice was deviated from, and a large incision being made; when it was found that nearly a foot of the colon was contained in the swelling, and could not be reduced. The incisions could not be made: yet, as further treatment, the skin cut round itself in the direction of the swelling, which was diminished, and, in about six weeks the cure was completed.—(*See Journ. of Foreign Med. No. 11, p. 400.*)

OPERATION WHEN THE HERNIA IS SO SMALL THAT IT CAN BE MORE EASILY EXTERNALLY REDUCED THAN THE OTHER.

In this kind of case, there is little appearance of external tumor; consequently, the disease is very apt to be overlooked by the patient and surgeon, and some other cause assigned for the various symptoms. The nature of operating, in this form of the disease, differs from that in the common scrotal hernia. The incision will be made in the direction of the spermatic cord, and the stricture will be found at the internal ring.—(*See Cases in Legation Hernia.*)

TREATMENT AFTER THE OPERATION.

Emollients (over the bowels) should be immediately prescribed by means of cythere, oleum ricini, or small doses of emulsion of diagenia, dissolved in poppyseed oil; but the patient should not be allowed to quit the recumbent position, or get on his legs, until, as long as it is apt to bring on a protrusion of the bowels again.—(*Chir. 4. 2. p. 262, col. 2, p. 263.*) The best plan is to let the patient lie on his back for the first seven days of the cure. In the course of another day, if necessary, follow the effects of the first purgation, and moderate doses of the belly zone, as, heat and general fomenting, with the exhibition of liberal doses of sweetened oil with opium are strongly indicated. For some time the cure is to be kept. When symptoms

of inflammation of the bowels and peritonitis threaten the patient, general bleeding, leeches on the abdomen, emollients, blisters, doses of the oleum ricini, and cythere, are the means deserving of most dependence, and should be resorted to without the least delay. In these circumstances, the warm bath, sometimes recommended, I think is more likely to do harm than good, by the disturbance in which it subjects the patient. When all danger of permanent inflammation is past, and the patient recovers for food and drink, heat, warm, and a generous diet must be indulged. The effluvia from the throat, with opium, is the best medicine for quieting the disturbance of the stomach after the operation. Opium and cordials are the most eligible for checking diarrhoea. As the operation does not usually prevent the parts from becoming separated again, a truss must be applied before the patient leaves his bed, and afterward necessary more.

PROPOSALS FOR THE RADICAL CURE OF THE HERNIA.

Of restoring the patient, applying cordials, or of the operation of the peritoneal cavity, with this view, I have only to say that they are hazardous, and not at all calculated for the attainment of the desired end. A description of these methods may be found in *Prod. Wiggins*, &c.

The old operation termed the vaginal stitch was one of the most pressing plans. It consisted in passing a ligature under the neck of the hernial sac, close to the abdominal ring, and then tying that part of the sac so as to render it impervious to the adhesive inflammation that ensued.

The vaginal stitch performed in this manner, has been actually attended with success.—(*Revue*, vol. 2.) The scrotal cysts were cured by Bernard, on similar principles; and Denard actually cured nine cases of the spermatic by tying the hernial sac.

Scroeder cured two intractable inguinal hernia, in one instance, by cutting away the body of the sac after tying the neck.—(*Chir. Pathol.*, vol. 2.) In some cases, Sir A. Cooper forced matter away the sac alone.

Dissecting away the whole hernial sac, or even leaving it open, was by a formidable operation, compared with merely making a small incision down to the neck of the sac and applying the ligature. If the hernia were reducible, and the upper part of the sac could be reduced, it was by the ligature, all other more severe plans would be superfluous. However, Petit, Sharp, Acut, &c. would have been led to prove the danger and inefficiency of the vaginal stitch; though it is true that some of these surgeons operated rarely in the simple manner above mentioned.

Butler recommended tying the neck of the sac, with the view of producing an adhesion at its sides to each other; a plan which he says he found very successful.

From the account, however, which has been given of the anatomy of the inguinal canal, it is obvious that none of these methods could do more than diminish the size as high as the ring, and leave that portion of it which is within the inguinal canal. Hence, the neck of the tumor will remain open for the descent of the viscera. The consequences, and that of the character of bad and fatal symptoms from any operation undertaken solely for this purpose, and necessarily required for the relief of strangulation, are the grounds on which these experiments are now disapproved.

CHIRAL OR FEMORAL HERNIA.

Vesalio, who wrote, in 1538, has distinctly pointed out the nature of femoral hernia, which, with this, has been generally confounded with inguinal hernia.

The parts composing this kind of hernia always protrude under Poupart's ligament, and the swelling is directed towards the inner part of the bend of the thigh. The rupture descends on the inside of the femoral artery and vein, between these vessels and the pectineus, through the *crural ring*, or canal for the transmission of the crural vessels. And, as Hesselbach has remarked, the lower opening of this ring is covered by the pectineus, the cause of the disease, the peritoneum spread over it being gradually pushed into it by various occasional causes, so as to complete the tendency to hernia. The natural position of the bowels may be changed either suddenly or by degrees. As soon as the bowels have

once passed the water aperture, or what Clapier terms more properly the lower opening of the crural canal, the hernia has more room for extending itself forward, and to work side, and the integuments now become elevated into an oval swelling, the long diameter of which is nearly transverse.—(*Dissection*, p. 47.) Gibbier names the passage through which the crural hernia protrudes from the abdomen, the crural ring; the femoral ring; and Clapier, the crural canal.

Persons are particularly subject to this kind of rupture. It has been supposed, that women and of thirty married women affected with hernia have this kind; but, that not one of a hundred, unassisted, female, or one of the same number of men have this form of the disease.—(*ibid.*)

"The crural hernia," says Scarpa, "is frequently observed in women who have had several children; a very sedentary life; and still more rarely men. In the latter, the vessels are more easily engaged through the inguinal ring by following the spermatic cord, than they can descend along the crural vessels, and raise the margin of the apertures of the crural muscle from beneath the inguinal arch. In women, an opposite disposition prevails, in consequence of the weakness of the inguinal arch, which is deep, and slender is situated lower down, and enters the pelvis. It is in men, while, on the contrary, the crural arch is more contracting by reason of the wider form of the pelvis. Reciprocal reciprocity may, but be never met with the crural hernia in the body of any female subject. And, at various fathers, and children is female subject of rare occurrence.—(*De Sed. et Caus. Morb.* epist. 34, 13.) Clapier gives us no exact description of the manner in which it is formed in women, as Prefat. He is often observed for this kind of hernia in females, not only once in the same subject.—(*Method. et Therap.* p. 406.) Marshall and Walker have both seen, but a singleness of it in the dead body of the male subject.—(*Obs. Anat. Pathol.* cap. 4, p. 72. *Anglæ Comment.* Anat. p. 24, vol. 23.) Arnaud himself, to whom modern surgery is highly indebted for many important concepts on the operation for the strangulated crural hernia in both sexes, candidly confesses that he had never had an opportunity of dissecting a female of this kind in the male subject.—(*Suppl. Traité des Hernies*, p. 201.)

Scarpa had, at the disposal of a male subject in which there was a crural hernia, and he avoided himself of the opportunity of examining the parts with the instrument. He first injected the blood vessels; he afterward dissected the parts contained in the disease; and he has published an exact description of the particulars, illustrated by an engraving.

According to Hirschbach, the femoral hernia, though not known in Italy, is more frequent than is generally supposed, and often overlooked on account of its being very small.—(*Chir. des Visc. Visc. et des Lignes* and *Schubert's*, p. 47.) Thus, in a manuscript published in a modern work, an individual and femoral hernia were met with together in a gentleman sixty-three years of age. On examination of the body after death, a small piece of intestine forming a crural hernia was found unperforated and contained under an inguinal rupture and a mass of fat.—(*C. Ruff's Surgical Obs.* vol. 3, p. 375.)

Mr. Lawrence states that the femoral rupture is not so uncommon as many authors would lead us to suppose. He has seen many instances of it.—(*On Ruptures*, p. 435, note, of 4.) Dr. Brinkley, it seems, has also seen it rarely in thirty instances of it in the position of Ruysscher.—(*Observ. et Obs. Anat.* de, cap. 16. *Mem. de la Soc. de Med.* p. 42.)

According to the observations of Scarpa, and all the best modern writers upon surgery, the crural hernia occurs both in the male and female subjects in the cellular substance, which encompasses the spermatic cord before Propagator's ligament. The swelling follows the internal side of these vessels and gradually detaches into the fold of the thigh, between the sartorius muscle, and peritoneal muscles. "Many surgeons believe (says Scarpa) that the femoral ring, and the substance which it contains, are indistinctly situated above the crural vessels and the neck of the spermatic cord, and consequently between these vessels and the anterior superior apophysis of the ilium. But as far as my knowledge extends, this assertion is not supported by a single au-

thor description of the crural hernia in the early stage it is seen, that when the viscous has not acquired a large size, and its fundus is confined to a point, confined to the fold of the thigh, it passes in a straight line the crural vessels, and even the spermatic cord, as Walker says it once observed.—(*Anglæ Comment.* Anat. p. 24.) But it is not thence to be concluded, that the fundus in the beginning followed directly the crural vessels, much less between them, and the spermatic cord, as a process of the sperm. Another error it is supposed from the fact of the hernia less becoming detached from the fundus to the outer side of these vessels. If these two cases ever happen, they must be very rare, and the best authors who have treated of crural hernia concur in stating that in performing the operation, they have constantly found the viscous attached to the fundus of the crural vessels, but never on their outside. Even when the viscous, after acquiring a considerable size, is removed transversely over the crural vessels, the fundus of the hernial sac, and always being found upon the inner side, that is to say, between them and the spermatic cord.—(*Chir.* de, cap. 2, p. 2, *La Fige* *Chir.* d'Opérations de L'Anatomie, p. 226. *Petit* *Opusculum* *Chir.* de, cap. 226. *Moreau* *De Sed. et Caus. Morb.* epist. 34, 15.) Arnaud (*Mem. de Chir.* tom. 2, p. 70. *Goss* *De Hernia* *Tabula*, p. 70.) Bistram (*Practical* *Chir. Operations*, 2, 1, *Chir.* p. 226.) Pot (*Chir.* *Opera*, *Chir.* vol. 2, p. 124.) Denon (*Précis de Med. Chir.* p. 115—116.) B. Hall (*Art System of Surgery*, vol. 3, p. 357.) Kellner (*Traité des Hernies*, cap. 36.) Nodding (*Chir.* de, cap. 2, p. 166.) Lemaire (*Ann. Med.* p. 1, p. 185), and many other writers all concur upon this point. "It is support of this opinion (says Scarpa) I could give a great number of cases in my own, which I have collected, either in operating on crural hernia, or in dissecting the same kind of hernia in the bodies of many female subjects, and in that of the male from whom I have taken the engraving, also having had an opportunity of dissecting a female in whom crural hernia, which becoming one third of the way down the thigh, I observed that the neck of the sac did not encroach at all upon the crural vessels, but lay entirely on their inner side."—(*Surgery*, *Traité des Hernies*, p. 202, 203.)

The hernia, on account of its situation, is liable to be mistaken for an enlarged inguinal gland, and many fatal events are recorded to have happened from the surgeon's ignorance of the situation of the viscous. Mr. Lawrence states, in a hospital surgeon mistake a crural hernia for a glandular tumour, and the patient died, without any attempt being made to afford relief by the operation.—(*C. 423*, of 4.) And also Petit (*Traité des Mal. Chir.* t. 2, p. 223, &c.) A gland (as very largely enlarged by the gradual effects of inflammation; the swelling of a crural cystis comes on in a moderate and sudden manner, and when strangled, excites the train of symptoms already described in the account of the inguinal hernia, which symptoms an enlarged gland could never occasion. Such confusions were to be sufficiently detected earlier, though the feel of the two kinds of swelling is often not of itself enough to make the surgeon decided in his opinion. It is particularly remarked by Hirschbach, that while a femoral hernia is discovered, that is to say, within the gutta opened at the pannus, through which the parts descend, the disease presents itself as a round, firm swelling, on the outer side of which the femoral artery can be felt pulsing; that such hernia may be mistaken for an enlarged gland, and the case may only be terminated by the history of its origin and symptoms.—(*Chir. des Visc. Visc. et des Lignes* and *Schubert's*, p. 22.) A femoral cystis may be mistaken for a tumour, which the experience part of the swelling lies over Propagator's ligament. As the same and operation for the case may be performed, directly from above for the latter, the error may lead to very bad consequences. The femoral hernia, however, may always be distinguished, by the risk of the latter being Propagator's ligament cystis.—(*Chir.* *Opera*, *Chir.* de, cap. 2, p. 2, *La Fige* *Chir.* d'Opérations de L'Anatomie, p. 226. *Petit* *Opusculum* *Chir.* de, cap. 226. *Moreau* *De Sed. et Caus. Morb.* epist. 34, 15.) Arnaud (*Mem. de Chir.* tom. 2, p. 70. *Goss* *De Hernia* *Tabula*, p. 70.) Bistram (*Practical* *Chir. Operations*, 2, 1, *Chir.* p. 226.) Pot (*Chir.* *Opera*, *Chir.* vol. 2, p. 124.) Denon (*Précis de Med. Chir.* p. 115—116.) B. Hall (*Art System of Surgery*, vol. 3, p. 357.) Kellner (*Traité des Hernies*, cap. 36.) Nodding (*Chir.* de, cap. 2, p. 166.) Lemaire (*Ann. Med.* p. 1, p. 185), and many other writers all concur upon this point. "It is support of this opinion (says Scarpa) I could give a great number of cases in my own, which I have collected, either in operating on crural hernia, or in dissecting the same kind of hernia in the bodies of many female subjects, and in that of the male from whom I have taken the engraving, also having had an opportunity of dissecting a female in whom crural hernia, which becoming one third of the way down the thigh, I observed that the neck of the sac did not encroach at all upon the crural vessels, but lay entirely on their inner side."—(*Surgery*, *Traité des Hernies*, p. 202, 203.)

In the male subject, the crural hernia, in the early stage (says Hirschbach), is situated so deeply in the fold of the thigh, that it is difficult, even to the most experienced eye, to find its neck; and in acquiring its circum-

ferres with the extremity of the finger, the tendinous margin of the opening, through which the parts are protruded, was only in pendence with considerable difficulty. On the contrary, the inguinal hernia, however small it may be, is always *very* distinct. It is about half an inch above the bend of the thigh. In carrying the finger upwards we seek the umbilicus, margin of the inguinal ring can be easily felt as its circular fissure; and at the posterior part of the small tubercle, the cord composed of the spermatic vessels is distinguishable. When the crural hernia has acquired considerable size, its neck is always deeply situated in the bend of the thigh; but its belly and fundus remains an oval form, and whose great diameter is situated transversely in the bend of the thigh. Whatever may be the size of the inguinal hernia, it always presents a lobes (as if a pyramidal form, the base or lobes of which, the first being directed towards the flange, follows exactly the direction of the spermatic cord, and descends directly into the scrotum. Besides the pyramidal form, which it has attained a firmness and presents some others, which are peculiar to it, such as a *cone of cancer* and *hemorrhoid* in the thigh, and *ulcers of the leg, and even of the foot, of the same side.* The reason why ulcers and abscesses of the leg are particularly prevalent in cases of femoral hernia, is partly referred by Broussais to the circumstance of the femoral vessels and nerves, with numerous lymphatics, taking their course through the crural ring; and, according to his observations, "the inflammation and ulcer are especially great when the protrusion, at certain, which makes stronger pressure on the vessels and nerves than excessively happens in cases of carcinoma."—(P. 33.)

"In women, however (as Broussais observes), it is less easy to distinguish the crural hernia from the inguinal. In fact, the absence of the spermatic cord, and the more situation of the ring to the external arch, very easily occasion a mistake. Nevertheless, a woman may seem to possess to have a double inguinal hernia of the same side. While, of these two distinct, though neighbouring hernia, one may be inguinal, and the other crural. Anand (Memo. Med. Chir. t. 2, p. 605) mentions instances of such a mistake.—(*Surgery, Traité des Hernies*, p. 27, 28.)

This interesting article takes occasion to observe further upon the neck of the subject, that the position of the inferior part of the abdominal ring, which separates this opening from the internal and inferior angle of the crural arch, is so slender in women, that it is sometimes hard to distinguish the crural from the inguinal hernia, which is not the case in male patients.

Until a few years ago, the stricture, in cases of femoral hernia, was always supposed to be produced by the lower border of the external oblique muscle, or, as it is termed, Poyzant's ligament. A total change of opinion on this subject, however, has lately taken place, in consequence of the observations first made by Lisfranc, in 1833. "In the crural hernia (says he), the aperture through which the parts issue is not formed by two bands (as in the inguinal hernia), but it is a foramen almost fixed, proceeding from the internal margin of the crural arch (Poyzant's ligament), and an insertion into the branch of the os pubis, between this bone and the iliac crest. So that, in this hernia, the branch of the os pubis is marked more internally than the arteries, and a little behind; the vein, externally, and behind; and the external border of the arch, before. Now, it is this border which always forms the constriction."—(*See A New Method of operating for the Femoral Hernia*.)

The utility of knowing that it is not Poyzant's ligament which produces the stricture in cases of femoral hernia, is important; for we then know, that cutting the lower and inner blade of the external oblique muscle is quite *irrelevant*. This proceeding is the more to be reprobated, because the lower pillar of the abdominal ring, in both sexes, will be divided by dividing the internal epigastric artery and vein; and that the abdominal and crural rings will be made too near together, so that, large enough to make the future occurrence of hernia very likely to happen. In this case there is also considerable danger of the spermatic cord being cut. Cutting Poyzant's ligament, on the other side is attended with still more danger,

for the spermatic artery will infallibly be divided in its origin, and with all these hazards, the incision must be quite useless, unless carried on to the internal edge of the crural arch.—(*Generalist*, p. 75.)

The Indians, however, of several modern writers to make the stricture in cases of femoral hernia, is not attributed by the most careful observers, the femoral and Ligament.—(*Ann. Chir.* t. 9, p. 32.) The former party remarks, that a complete femoral hernia may be strangulated in two places, either at the point of its issue, or at the point through which the protrusion happens. Nay, they say, that the strangulation is sometimes caused by the outer opening, which is termed *ligament*, and they are convinced that the constriction is produced by dividing the muscle.—(P. 33.) And, in addition to these two modes of strangulation, it is to be imagined a third, in which the viscera are constricted by passing through some weaker point, or accidental opening, in the anterior part of the crural arch.—(*Revue Méd.*, p. 41. *Chap. de la Hernie*, p. 50. *Ann. Chir.*, p. 32, p. 135, et even through a rupture in the outer side of this passage, as we find related in the 17th lithograph of Larrey's treatise, "De l'Anatomie Pathologique."

I know of no English writer who has given a better account of the anatomy of the femoral hernia than Larrey.—(*New Med.* t. 2, p. 115, &c.) He observes, that when the direction is begun at the inside of the inguinal region, the following circumstances are noticed: after the removal of the peritoneum from the abdominal muscles, and from the psoas, iliacus, and the great vessels, the inner surface of the diaphragm will be seen at incision, which Clogier terms the *fascia transversalis*, and which is always a white gleaming appearance. From the place where the femoral artery and under Poyzant's ligament, while the superior space of the iliac, the ascending fascia is inserted in a strong fibrous band behind the outer surface of Poyzant's ligament, and a thin continuation of it is attached over the iliacus internus and psoas muscles, which it is named by J. A. Cooper and Clogier the *fascia obliqua*. The fascia of the transverse muscle covers the belly behind Poyzant's ligament, as completely as the peritoneum does, so that between the femoral artery and the anterior superior spine of the iliac bone, the *fascia transversalis*, which occurrence, is still farther preserved by the *fascia lata*, which, below Poyzant's ligament, is closely attached to the muscles of the thigh. By the point being thus shut up, the weight of a crural hernia on the outside of the femoral vessels is rendered quite impossible.—(*Larrey*, p. 41.) This part of the explanation very amply resembles that delivered by J. A. Cooper, except that the latter describes the iliac fascia, and not what Clogier calls the transverse fascia, as closing the point from the spine of the ilium to the crural vessels. But this difference is easily reconciled by the circumstance of J. A. Cooper excluding the name *fascia obliqua* behind the iliac vessels given by Clogier and Larrey.

Now the anterior superior spine process of the iliac, Larrey remarks, that the fascia of the transverse muscle has some minor folds, which pass over the upper and internal opening of the inguinal canal, of which they form, with more, the *ligament*, and are named by Lisfranc the *external epigastric ligament*. They enclose the femoral artery and vein, are connected above with the fascia of the transverse muscle, and below are continued into the fascia of the psoas and iliac muscles. When these fibres pass over the femoral vessels, they expand into a firm expansion, which, passing downwards, is immediately attached at the inner side of the femoral vein to the internal branch of the os pubis, close to the symphysis, and then joins the aponeurosis of the recti inguinali. The expanded portion of the expanding tendons, then, that continues along the crura of the os pubis to the sheath of the rectus, forms the lower portion of *Gruber's*, or the *fibrous*, or *external ligament*. The inner edge of this ligament is filiform and caprine, the concavity being turned towards the femoral vein. Now, when the fascia of the transverse muscle extends downwards on the outer side of the crural artery, to the fascia of the os pubis and iliac muscle, joins to the fascia of the psoas, between that vessel and the anterior superior spine process of the iliac, it also forms, like Gruber's ligament, a filiform edge, the concavity of

directly with the first fascia, while the external portion encloses these vessels separately, just before the crural arch, and the vessels themselves are immediately situated between these two divisions of the fascia."—*On Regener's*, p. 261, vol. 4.

Where the insertion of the fascia lata into Poyat's ligament ends, it forms what Mr. Ruge of Glasgow called the *falciform process*, the lower part of which is situated in the above ligament, while the lower portion extends further down the thigh. The continuity of the falciform process is directed towards the palm. This well-marked connection is one chief cause, may be said, of the thigh, and rotting it outward, renders the crural arch tense.

The fascia being stretched in front of the pectineus, most of course is directed to the fascia lata. In my opinion, surgeons are very much indebted to Mr. Lawrence for his able explanation of this fact. As for myself, I am careful enough to note, that while I read his clear and concise account of the anatomy of the crural region, I could never bring my accurate notions concerning the relative structure of the femoral vein and fascia of the thigh, from other able and able works, with the exception of those of Blandin and Langenbeck, to represent the accuracy so perfectly furnished. Mr. Lawrence remarks on, however, that the particular femoral hernia, contained in the sheath of the femoral vein, lies under the fascia, p. 270, vol. 4. And he mentions, that "the upper end of the falciform process passes over the upper and outer part of the neck of the femur; it is then folded under the crural arch, and contracts into the first pectineus node. The line just is placed on its upper side, the palm is directly below it; and the upper and outer part is bounded by the falciform edge of Poyat's ligament. It is this part which forms the femoral node."—*On Regener's*, p. 261, vol. 4. While, however, the latter statement is made by this gentleman and others, Mr. Ashley Cooper as positively declares that the sheath is never stretched at Cooper's's ligament, but at the crural arch, just before the sheath leaves the abdomen.—*See Law's*, vol. 2, p. 502. He also mentions, that he has known the structure continue after the division of that ligament, and the pectineus line. The most comprehensive view of this part of the subject taken by Blandin and Langenbeck, I have already explained.

The inner side of the crural ring or canal, as already explained, is connected with the fascia of the transverse muscle. And, according to Langenbeck, below the arch of the fascia lata, which forms the external femoral for the femoral vessels, the outer side of the crural canal is sometimes formed by a continuation of the fascia of the transverse muscle, as he found frequently in both sides of one female subject. In such a case there is a good deal of fit between the fascia lata and the aponeurosis of the transverse muscle, and the two parts are easily separated. Langenbeck adds, however, that the same aponeurosis may arise from a splitting of the layers of the fascia lata. Frequently the front side of the crural ring is so small, that the covering cannot rightly be termed a canal, and it is always shorter than the posterior side. When the outer side exists, it is extended across the lower, over the space between the two femora, and is then connected with the aponeurosis of the pectineus directed from the fascia of the psoas and levator ani muscles. In the anterior and longitudinal of the crural canal, there are some small openings. Doubtless, this structure is referred to by Blandin, when he says, that it is the whole subject the same as before for the femoral vessels is better closed by a net-like web of tendinous fasciculi. The posterior side of the crural canal, or ring, is mainly formed by the part of the fascia of the psoas, which enters its lower opening and joins the aponeurosis of the pectineus muscle. The outer side of the crural lies under the fascia lata, and joins the external and posterior side, where the aponeurosis of the transverse and femoral muscles proceed to the outside of the femoral vein. Langenbeck thinks the opening by which the vein separates passes over the lower side of the falciform process of the fascia lata, might be named the lower aperture of the crural canal.—*See Langenbeck's* *Med. Zeit.* für die Chirurgie, 3-2, p. 125, 127, Nov. München, 1863.

According to Blandin, in femoral hernia, the two apertures of the passage now termed the crural or ce-

tral ring are one-half larger than normal. The outer portion of the sheath of these vessels is perfectly intact, and with it the epigastric artery. The femoral vein no longer lies in the external end of this opening, but rather at the back of the crural pharynx. The external straight edge (the falciform process) of the outer opening is turned more upwards and upwards, and is tightly applied even to the distended femoral vein. In this state of the parts, the lower opening lies as a rule from the middle of the diameter of which, the distal of the inner opening is the passage of the femoral vessels, is transverse. The arch of the femoral vein is that portion of it which lies within the space between the two openings. The posterior side of the crural or passage, now frequently named the crural or femoral ring, is larger than the anterior. In one large femoral hernia, Blandin found it as high as eight inches, but the anterior side of the passage more than one inch in height. The greatest diameter of the lower opening was one inch, five lines, whereas that of the outer one was only one inch, four lines. Most of the posterior part of the neck of the femoral vein, with the hinder side of the canal, lies upon the pectineus muscle, and towards the outer side upon the femoral vein. The neck of the hernia on either side lies in the epigastric line to the posterior side of the psoas. At the outer opening of the passage, the neck is situated at almost a right angle towards the body of the vein; the upper portion of which lies upon Poyat's ligament, but the largest part of it is situated in the compressed lateral of the femoral vein, by which the outer side of the body of the vein, as high as the neck, is separated from the crural vein and level. In the whole subject, when the conditions, named with the cellular substance covering the outer opening of the passage, make great resistance at particular points, the femoral vein, a femoral hernia may be double, or even divided into several portions, a proposition exhibiting which occurrence, is in the anatomical museum at Würzburg.—*See Blandin*, p. 42. Except in a few cases in which the veins had claims of the epigastric artery, no femoral, that vein was very close to the external side of the neck of the femoral vein, much more than it does in an internal hernia.

The use of the femoral hernia of exceedingly narrow at its neck, and while its body begins, it becomes expanded in a pleated form; the use of the following is generally of an oblique pyramidal shape. The body of the use of the femoral hernia makes a right angle with the neck by being drawn forward and upwards. A circumference very necessary to be known in trying to reduce the pain by the tails. Though the tumor formed by the body of the use, is oval and nearly transverse, it is found, when attentively examined, to take the direction of the groin, which extends obliquely downwards and forwards, the outer rather smaller end of the swelling being somewhat higher than the outer.—*See Blandin*, p. 50.

The use of the femoral hernia is said by Mr. A. Cooper to be covered by a kind of membranous expansion, consisting of compressed cellular substance, and named by him the *fascia propria*, which is thus described: "A thin fascia entirely covers the opening through which the femoral vessels, and descends on the posterior part of the psoas. When the hernia, therefore, enters the sheath, it passes that fascia before it, so that the use may be perfectly drawn from its inner side, and the fascia which covers it left distinct. The fascia which forms the crural sheath, and in which are placed the hole or holes for the abdominal vessels, is also protruded upwards, and is joined with the other, so that the two become thus consolidated into one. If a large hernia is examined, the fascia is found to proceed upwards, as far as the edge of the web on the lower side of the crural sheath by which the hernia descends; but in small hernia it passes into the sheath as far as the pectineus, and forms a pouch, from which the femoral vessels are withdrawn, leaving this hernia complete over the hernia."—*On Hernia*, part 2, p. 8. However, Mr. Lawrence has not seen, and is not, on dissection, the above described use of the fascia, and is covered the opening through which the hernia passes, nor does his account refer to covering of the hernia, in ordinary cases, or an elongated protrusion of the sheath for the crural vessels. According to Mr. Ashley Cooper, a weak aponeurosis, which forms the superficial fascia of the head of the

Mr A. Cooper recommends the incision to be directed "obliquely upwards and laterally, at right angles to the crural arch." In consequence of the very deep situation of the posterior edge of the crural arch, and the tight manner in which the posterior sheath is surrounded by the ligament, this elevated position considers that the incision is at great danger of being wounded with the knife, if not made sufficiently oblique. However, the position is to divide the sheath in its anterior part, as in the front margin of the crural arch, directing the edge of the knife upwards and laterally. "If this is not sufficient, he afterwards cuts the thin posterior border of the sheath in the same direction."

After making an incision on the side of a femoral hernia with particular care, on account of its being much thicker than that of a umbilical, and (as might be added) on account of its solid communicating fold, and when having no concern in it covering the incision, Mr. H. remarks: "The structure made upon the epigastric part is very great, as I have already observed; but if the tip of the finger can be introduced within the femoral ring, he finds the umbilical knife, a small incision for the ring is necessary, well be sufficient to cut the point of the ring. If the tip of the finger cannot be introduced at the proper place, a dissection with a long groove must be used instead of the finger; but I prefer the latter. The finger or dissection should not be introduced very near the great vessels, but on the side of the intestine or sacculus which is nearest to the epigastric of the cord path. The incision may then be made directly upwards. The surgeon should take especial care to introduce his finger or dissection within that part where he finds the greatest to be the greatest, which is the species of hernia, or the most interior part of the wound."—(P. 125.)

Cooper's mode is preferable to Mr. H.'s, because, were the operation done on a male, cutting directly upwards would endanger the epigastric cord. In order to obviate this risk, Mr. A. Cooper makes a small incision above Poupart's ligament, and divides the cord out of the way of the knife, with a best probe.

Mr. Lawrence has noticed that an "incision of the most interior part of the sheath is free from all danger, in the ordinary course of the vessels. But that variety, in which the abdominal artery, arising from the epigastric, runs along the inner margin of the sac, seems to preclude us from saying even in this direction." Hesselbach met with a remarkable instance of such irregularity in the origin and course of the abdominal artery in the body of a female, in whom there were two small crural hernie. On the right side, the epigastric and abdominal arteries arose, by a common trunk, from the root of the sheath below Poupart's ligament. They soon separated from one another, the epigastric taking its ordinary course upwards at the outer side of the neck of the hernial sac, while the abdominal made a considerable loop, and ran transversely towards over the artery fibres of the femoral ligament, and continued the anterior and inner side of the neck of the hernia, whence it afterwards proceeded obliquely downwards and laterally, behind the horizontal branch of the coeliac, towards the abdominal foramen.—(Hesselbach, p. 32.) A mode of operating has lately been proposed (*Edin. Medical and Surg. Journal*, vol. 2, p. 235), with a view of avoiding this danger. We are directed to make an incision through the aponeurosis of the external oblique muscle, just above the crural arch, and in a direction parallel to that part; to introduce a director under the sheath from this opening, and to divide the tendon to the right of the director, by means of a curved knife passed along the guide.—(Edin. Med. and Surg. J. vol. 4, p. 126, col. 4.) For reasons which Mr. Lawrence states, this plan is certainly not altogether advisable, and, upon the whole, Hesselbach's method of opening the sheath is the safest. Hesselbach uses a curved probe-pointed bistoury, that runs with its convexity in the direction of the sheath, and with it under the structure, and then its edge is moved upwards, the incision being extended through the upper end of the femoral foramen to the margin of the crural arch.—(*Practical Course*, &c., p. 125.)

Many surgeons, that the abdominal artery may arise from the epigastric, once in twenty-five or thirty subjects. But allowing that it originates more frequently, it then does not always deviate from its usual course along the cord of the sac. Mr A. Cooper says: "In

all cases which I have myself dissected, where this artery entered with crural hernia, the observation has passed into the pelvis, on the party side of the neck of the sac, exiting out of the neck of the danger of the sac."—(On Crural Hernia, p. 31.) Mr. Lawrence concludes, that the comparative number of instances, in which it is found on the opposite side, cannot be more than one in twenty, and consequently, if we admit that the aberrant artery arises from the epigastric once in five times, it would only be falling to be wounded once in a hundred operations.—(P. 122, of 1.)

When the height and course of the epigastric artery differ from what is common, this vessel, as Hesselbach remarks, sometimes passes internally above the horizontal branch of the coeliac, and it ascends towards the rectum itself, and when this variation exists it is a case of femoral hernia, the artery does not pass over the outer side of the neck of the sac, but runs under it, and they run on the inner side. Hesselbach has seen only one instance of this irregularity of the epigastric artery in a female, and never in a male subject.—(Lectures on Surgery, &c., Dr. Lawrence and Schenck, vol. 2, p. 22.)

And lastly, M. Chiquet extended this list for the purpose of collecting the various number of cases, in which the origin and course of the abdominal artery are different from what is most common. He found, that when this artery and the epigastric arise by one common trunk, they sometimes separate from each other above, and rarely below the upper opening of the crural arch. "In the first case, the largest their common trunk, the closer do they lie to Poupart's ligament, and in the lower edge of the upper opening of the abdominal canal. In the second case, the common trunk of these arteries arises within this canal, and the two vessels then again take the above." In 160 bodies, of which 87 were male, and 73 female, the abdominal artery arose on both sides from the epigastric; and only in 36, of which 21 were male, and 15 female, did it arise on one side from the epigastric. In 28, of which 15 were male, and 13 female, the abdominal arose on one side from the epigastric, and on the other from the epigastric. In six bodies, viz. two male and four female, it originated from the crural.—(Arch. Med. and Surg. for November, Paris.)

It is observed by Professor Scarpa that "the round ligament of the uterus, in passing through the abdominal muscles, follows precisely the upper tract of the epigastric cord. It is equally situated behind Poupart's ligament, with the difference, that it does not become so dilated from the internal extremity of this ligament, as the epigastric cord does, because it has not so far to run, in order to get from this ligament to the internal ring, the latter opening being situated lower in the female than the male subject." The round ligament, like the epigastric cord, the common epigastric artery before reaching the ligament ring. And as the crural hernia always begins in the internal and inferior part of the neck of the sac, as well in the male as the female, it follows that, in the first case, the epigastric artery remains in its natural situation, and luxuriantly corresponds to the external side of the neck of the crural hernia; while the epigastric cord is seen, and the round ligament is thrown over the extremity of the first of the neck of the hernial sac. In the operation for the crural hernia, in females, the incision of the neck of the hernial sac and crural arch, when directed upwards towards the femoral vein, cannot wound the epigastric artery, which it is of the most consequence to avoid; but it always divides, either equally, or partially, the round ligament of the uterus, which cannot lead to any dangerous hemorrhage; for, except in the period of pregnancy, the arteries of the round ligament are very small; they are almost obliterated in women advanced in years; and, in general, they are quite capillary in the extremity of the ligament adjoining the ring. Hence, it cannot be surprising that so many crural hernie have been successfully operated upon in women by cutting the hernial sac and crural arch directly upwards, while not a single instance can be cited of such an accident being made in them without mischief, although, in both sexes, the epigastric artery may have been involved in operating by this process.—(Scarpa, Treatise on Hernia, p. 240.)

In operating upon the crural hernia in males, Scarpa recommends us to follow a method, which he calls new, but which, in fact, is the same as that advised by Gim

hernia." "I have found (says Scarpa) that, in fact, the neck of the hernial sac may be divided without danger, by giving to the incision a direction exactly contrary to that which is pronounced in the female subject. After having opened the hernial sac, it is to be drawn outwards by one of its sides sufficiently to allow the introduction of a small dissector between its neck and the stratified ligament, the groove of the stratified ligament being directed towards the internal and inferior angle of the crural arch. A properly guided bistoury, the edge of which is also to be directed downwards towards the point of insertion of Poupart's ligament to the pubis, is to be pushed along the groove. By this means the neck of the hernial sac will be divided in whole length at its internal and inferior end, and Poupart's ligament will be cut close to its attachment to the top of the crural arch. The epigastric artery will certainly be avoided, because it lies upon the opposite side of the hernial sac. As for the spermatic cord, I have demonstrated, that it is situated on the fore part of the neck of the hernial sac; consequently it cannot be divided by an incision made from above downwards, while it is necessarily cut in the ordinary method, since the style is carried from below upwards. In the first case this part may be the more easily avoided as well as kept at some distance from the internal and inferior angle of the crural arch. In fact, it is in this place that it exists, as we have seen, the edge of Poupart's ligament, in order to ascend towards the inguinal ring. "The incision that I propose (says Scarpa) the only has the advantage of dividing open the neck of the hernial sac in whole length, it also divides a part of the insertion of Poupart's ligament into the upper part of the crural arch, a thing that greatly contributes to relax the crural arch, and facilitate the reduction of the hernia; of those at least, which are not obstructed by the sac."—(Scarpa, op. cit. p. 223.)

Although this accurate anatomist and surgeon, at the time when he first published on hernia, was quite unacquainted with the valuable works on the same subject, which had made their appearance in this country, he is equally to be admired, both in his account of the inguinal and crural hernia, here strongly his diagnoses and observations tend to confirm every thing that has recently been pointed upon in modern works, respecting the place where the balano-circus first passes, its passing through a sort of canal before it comes out of the abdominal ring, the advantage of cutting in the crural arch in the internal and inferior angle of Poupart's ligament, or, in other terms, that part of the ligament which was first particularly pointed out by Glisson, as forming the principal part of the strangulation.

Heslinski considers my incision through the outer side of the crural ring safer than one through Glisson's ligament, and safer in women than here. In women, he recommends the cut to be made through the middle of the fore part of the ring, nearly straight forward, or a little inclined inwards, in which mode the epigastric artery cannot be hurt, whereas it lies at the inner or inner side of the neck of the sac. In men, my incision, directed obliquely upwards and inwards, being, almost, he says, on account of the position of the epigastric cord; therefore, in the male subject, he advises cutting the inner side of the opening, that is to say, Glisson's or the female ligament, directly towards the symphysis of the crural arch.—(Gibbs, *des Chirurgie des Femmes et des Maladies*, p. 54.) When the epigastric or crural artery is divided from its usual course, and surrounds the inner side of the neck of the hernia (which variety can never be undertaken as safely, as a wound of the vessel) Glisson remarks as unavoidable.

From the views taken of internal hernia in this article, I consider the unobstructed direction straight to cut Glisson's ligament to be the operation perfectly necessary. For, as Langerbeck has stated, the seat of strangulation may either be in the external opening of the crural canal, or in the opening of the femoral ring, or in the side of this opening, or in its lower opening, where indeed Glisson's ligament is truly collected. When the strangulation is in the first two descriptions, only the vessels have need be cut; but in the third, and the fourth case, the inner considerable edge of the internal opening of the ring, seat of course is divided. In all cases, says Langerbeck, whether the strangulation is caused by the sides or internal opening of the crural

canal, or by an aperture in the first process of the passage, the stricture must be cut inwards, as enclosing the vein in the first description would injure the epigastric artery. When it is posterior, in the opening, that the neck of the hernial sac is somewhat close below, and behind the external edge of the abdominal ring, then the inner opening of the crural canal is to be divided inwards, with the knife directed along the horizontal course of the crural arch, under the external edge of the ring, towards the symphysis of the pubis. If, in such a case, the knife were carried upwards and upwards, that part of Poupart's ligament forming the upper side of the crural canal would be cut, and the spermatic artery injured.—(Nieuw Boek, 2. p. 223.)

Dr. Travers has published some remarks, in favour of employing distention, instead of an incision, in the operation for the stratified crural hernia. He observes, that even when the common trunk of the abdominal and inguinal arteries is short, and somewhat protruded under the first of three arteries, which may be ligated the upper and invariable of the hernia. An operation performed upon a woman, at La Charité de Paris, for a strangulated femoral hernia, the true ligament was divided in Glisson's way by an incision, exactly parallel to the horizontal course of the crural arch, and the external artery was wounded. The patient died eight days after the operation, having been previously attacked by typhus and erysipelas. On dissection, about six ounces of putrid blood were found in the lower cavity of the pelvis, and the iliac artery cut. The vessel arose from the epigastric, ran upwards upper edge of the inner opening of the crural ring, of ring, and then descended along its inner edge, towards the external ring. This communication of the abdominal artery leads Dr. Travers to suggest the following rule: "If, after the hernial sac is opened, the bowel cannot be reduced, the artery springing at the crural canal should be cut directly inwards, in order to produce a considerable relaxation. But, if the incision should not be agreeable, the strangulation being at the lower opening of the canal, then at the point it is to be made to intersect the end of the right through the constriction, a plan will not have answered very often in the practice of serious crural hernia. Should the relaxation be too great, but yet, as the vessel is so exposed, Travers advises the artery to be cut directly drawn inwards and upwards, inwards the canal, with Arnould's testicles, assisted by the introduction of the finger, or with two hands. When this plan fails, he recommends Scarpa's process of dividing the anterior edge of Poupart's ligament with a pair of blunt-pointed scissors, and that the use of Arnould's instrument again.—(See *Archiv. Med. et Chirurg. pour les Écoles de Médecine*, t. 5, p. 2.) The consideration, however, which will ever prevail the common adoption of Dr. Travers's suggestion, is, that fifty times more lives would be lost by the method done to the protruded bowels by the female production of the finger and thumb, than by incising down the obstructed or inguinal artery, with the course of the finger is irregular.

Of late years, a kind of considerable interest has been awakened in relation to the crural hernia; viz. the possibility of the bowels by the method of the operation, and the sharp edge of Poupart's ligament, is a point, that either a permanent contraction of the artery, alteration of the arterial and venous state, or even that of the veins (the last may occur, followed by final extravasation, after the reduction of the hernia by the operation)—(Glisson, in *Med. Chir. Praxis*, vol. 2, p. 224; *Abhandl. ch. cit.* vol. 2; *Ann. Chir.* p. 117, 118.) Hence, the latter gentleman is an advocate for gently drawing out the bowels, after inserting a fluid structure; if it is removed he would be exposed to perfect loss of the vein, he advises its reduction; but, in the opposite case, he directs to be left out of the abdomen, rather than that the patient should be exposed to the danger of effusion into the abdomen.—(P. 441.)

CONGENITAL HERNIA.

Before the beginning of the sixth month of the fetal state, the tunica is situated near the kidney, where it receives a covering from the peritoneum, and into the after abdominal space. Between the beginning of the sixth month, and end of the seventh, the tunica has either descended as low as just above the umbilicus,

small ring, or else by passing through it, or around a little below it.—(Frisberg, *Ann. Roy. Acad. Med.*, 1788.) When the tunica passes through the abdominal ring into the scrotum, it is supposed to form a protrusion of the peritoneum, which afterwards contracts the tunica vaginalis, while the peritoneal investment, which was given to the tunica in the abdomen, is closely adherent to this body, and forms what is termed the tunica albuginea.

After the descent of the tunica into the scrotum, the communication between the cavity of the tunica vaginalis and that of the abdomen becomes obliterated, which latter event is usually effected before birth, sometimes not till afterward, and, as a few authors, even as late as the adult state.

In the congenital hernia, the protruded viscera are enclosed in tunica vaginalis, in contact with the testis, having descended into this position before the closure of the communication with the abdomen. Of course, the tunica vaginalis lies in the hernial sac. The nature of this case was not understood, before it was elucidated by Hager in 1755, and the two Hesters in 1762 and 1764.—(See Hunter's *Med. Comment.*, *Haller's Opuscula Pathologica et Opera Medica*, t. 3.) Many particulars, relative to the origin and formation of this hernia, having been given in the fifth edition of the *First Lines of Surgery*, I shall not here repeat them. Before the peritoneum now named, surgeons supposed the circumstance of the contents of the hernia and tunica being in contact, as the tunica having made their way, by absorption, through the tunica vaginalis, from the ordinary internal sac of a hydrocele. The allusion, indeed, is perfectly true; but, in point of their doctrine, that some tunica are attended with a protrusion of the peritoneum.—(See Abernethy's *Lectures*.)

From the foregoing, the right surgeon, that this hernia always existed in the time of birth. The protrusion, however, seldom occurs till after this period, on the expansion of the canal leading either of hernia or sperm. It does not uncommonly happen at some months after birth, and, is coming sometimes, not till a late period. Mr. Hey's case, in which a hernia congenita was first observed, in a young man, aged sixteen, whose right testis had, a little while before the attack of his disease, descended from the scrotum.—Is the generally of cases which actually take place when the tunica descends into the scrotum before birth, the case may be referred to the tunica having contracted an adhesion to a piece of membrane, or membrane, as the passage in the ring. In an infant, whilst a few days after birth, Withers found one tunica, which had not passed the ring, adhering by means of a few slender filaments, to the osseous, just above this aperture. Dependent adhesion of the tunica to the adjacent viscera, instead of leading to the formation of a congenital hernia, only prevent the descent of the hernial organ. Cooper examined the body of an old man, in which the testis lay on the pectus and adhesion tunica, connected to the sigmoid flexure of the colon, while an inguinal hernia existed on the same side.—(Becker's, *loc. cit.* p. 24.) Sometimes protrusion at all happens, even though the communication between the tunica vaginalis and abdomen remains open in the adult subject, as is particularly illustrated in a case recorded by Hesselbach, where each communication existed on each side in a man thirty-eight years of age, without any hernia.—(Med. Clin. *Review*, 1815, p. 100. Also, *J. Cooper*, in *Lancet*, vol. 2, p. 672.)

The appearance of a hernia is very early noticed. Mr. Pott observes, will always think it probable that it is of this kind; but he was not correct in assuming, that it is the first thing that he notices for suppurating his rupture on the day out, but his having been attended with it from his infancy, and that there is no external mark of character whereby it can be certainly distinguished from one sustained in a common hernial sac. This supposition is erroneous, because as the hernia organ is attended with an responsibility of feeling the testis, which part in the common hernia is always the distinguishable body the feeling of the hernial sac.—The hernia congenita, when communicating, "ought, like all other hernia, to remain, when reduced, and constantly keep up a pain, swelling, and when attended with symptoms of inflammation, it requires the same discharge, treatment as the common hernia."

Mr. Pott observes, that "in very young children, a piece of intestine, or stomach, may get partly let down in the bag, while the rest is still in the groin, or even within the abdomen. In this case, the suppuration of a tumor would be highly improper; for, in the latter, it might prevent the descent of the tunica from the belly into the scrotum; in the former, a more conveniently tense and injure it, give a great deal of unnecessary pain, and give proof of no real cure. Such hardages, therefore, ought never to be caught into a rupture in an infant, unless the testis can be fully felt in the scrotum after the gut is cut it is reduced, and otherwise can be so felt, a tumor can never be put on too soon." This is also the advice delivered by Sir A. Cooper.

As Mr. Pott has explained, an old rupture, originally congenital, is subject to a rupture made by one the testis, as well as to that produced by the abdominal ring, or, as might have been added, to that caused by the linear opening of the inguinal canal.

The gut is reduced several times, but in the end and in the latter. "I have seen (says he), such structure made by the gut of one of these hernia, as produced all those bad symptoms which render the operation necessary; and I have seen with very different structures, it was on each instance from each other, in the body of a dead boy, about fifteen, one of which would the intestine so thick that I could not disengage it without dividing the sac."

In this kind of hernia I have also very frequently found adhesions and adhesions of the parts to each other than in the common case; but there is one kind of congenital sometimes met with in the congenital hernia, which can never be fixed in that which is in a common hernial sac, and which may furnish all the difficulty of its operation or solution; I mean that of its adhesion with the tunica.

If a large quantity of fluid should be collected in the sac of a congenital hernia, and by adhesion and compression of the parts within the tunica into it from the abdomen should be finally closed, (a case which I have twice seen,) the tightness of the tunic, the difficulty of disengaging the testis, and the fluctuation of the fluid, may common it to be mistaken for a common hydrocele; and it will attend to other circumstances, but trusting myself to the test and look of the tumor, I presume to be mostly true, it may create a great deal of trouble, and possibly do fatal mischief.—(Pott, vol. 2.)

Mr. Pott also believed, that congenital hernia, or those in a particular case, are generally gradually formed, that is, they become inguinal, and by degrees become scrotal; but that the inguinal are seldom accompanied by the patient to have been in the groin only. As the tunica vaginalis is thicker than the peritoneum, one portion of a congenital hernia may not so much felt as those of a common rupture. In children the tunica generally communicates only, the overture can be felt; in these sufficiently long externally to protrude.

The sac of a congenital hernia, especially when the one is congenital, is every where equally tense. (Hesselbach, p. 26,) and below it the tunica cannot be felt.

The reader need not conclude, however, from the above account, that every rupture in children is congenital. Mr. Lavern is indebted a case of strangulated hydrocele, which took place in an infant only twenty months old.—(J. G. Med. J.,

The common inguinal hernia, which first protrudes at the lower opening of the inguinal canal, and which has the tunica arising on the inner part of its neck, has been termed by Hesselbach external; while the less common instance, in which the tunica has its origin directly on the apertures of the transverse and internal oblique muscles, and goes directly on to the abdominal ring, having the tunica arising on the outer side of the neck of the sac, is distinguished by the epithet internal.—(Cooper, *Chir. Med.*, 1826, p. 600. Also *Cooper's Lectures*, 1826, p. 100.)

The internal congenital hernia, as collected above, is divided into external and internal; it is evident that it might always be external, above the neck of the tunica, and might correspond to the part, at which the spermatic cord passes under the tunica of the hydrocele muscle. As for other circumstances, the tunica vaginalis has in its whole extent to the same

surface to the back of a common vegetable leaflet. Now this, it passing constantly through the inguinal canal from one side to the other, passing upon the anterior surface of the spermatic cord. Consequently it passes between the semitendinosus and the tubercle above of the oblique foramen, and the muscular belly of the spermatic muscle.—See Whistler, *Opus. Comment.* about p. 24. After coming out of the ring, as it is always found to do, spermatic cord, it is enclosed by the musculo and aponeurotic sheath of the spermatic funicle, which accompanies it to the bottom of the scrotum. Hence the tunica vaginalis, enclosing the displaced vessel, enters the inguinal canal on the outside of the point at which the spermatic cord crosses the epigastric artery. It is evident, then, as it follows along the direction of the cord it must also cross the artery, and remove it from the situation on the other side of the ring according to the position already explained in speaking of the common inguinal hernia. Hence the displacement of the epigastric artery constantly happens in the inguinal canal, just as it does in the ordinary external inguinal hernia.

But these two species of inguinal hernia have some analogy in each other, as is proved by the particulars mentioned there, yet they present some remarkable differences. 1. The common inguinal hernia, whether strangulated or external, when it extends into the scrotum, cannot descend beyond the point at which the spermatic vessels enter the testis. The other cellular difference of the spermatic cord remains. Thus the hernial sac must also necessarily herniate. In the contrary, in the common hernia, the vessels may descend lower than the testis, with which they are in contact, and descend; and at length, they occupy the situation of the spermatic vessels, which is then pushed downwards and backwards. 2. In the case of a common hernia, the descent of the vessels from the groin to the scrotum, completely takes place at a very short time, and in some moments particularly. It is much slower and more gradual in the ordinary inguinal hernia. The reason of this difference is very plain. In the first case, the descent of the vessels, and the formation of the tunica vaginalis, take speed and prepared the way, which the vessels again follow in forming a protrusion; while, in the second, the hernial sac cannot descend into the scrotum, but by gradually displacing the layers of the cellular envelope which join it to the surrounding part. This fact is so generally known, that experienced practitioners consider the protrusion with which the vessels have descended from the groin to the bottom of the scrotum, as a characteristic sign of a "scrotal inguinal hernia!"—[See, *Treatise on Hernia*, p. 72, &c.; *Monro's*, p. 35, Part, &c.]

In the hernia vaginalis the spermatic artery and vein are sometimes on one side of it, and the epigastric behind it. A protrusion, exhibiting this situation of the cord may be seen in the museum of St. Thomas's Hospital.

If circumstances will admit of a man being applied and worn in cases of scrotal hernia, of course success there will be a considerable chance of a radical cure being effected, in consequence of the natural proximity of the spermatic between the abdomen and tunica vaginalis to become closed.

In the operation the surgeon has to lay open the tunica vaginalis, instead of a common hernial sac. Now, as Dr. Aclay Cooper judiciously recommends, this operation should not be performed during life, but because a sufficiency of it should always be left to render the vessels, and also, because the spermatic artery and vein are situated obliquely on the first and larger portion of the inguinal. He therefore thrusts three fingers of the lower part of the tunica vaginalis to be left undivided.—See Cooper, vol. 2, p. 175. The incision is to be directed on the same principle as that of an inguinal hernia, and it is in the same position. As, in a case of inguinal hernia, the point is a ways protruded on the outside of the spermatic artery, the structure may be safely divided towards the flum, as well as directly afterwards.—See Cooper on Hernia, p. 307, &c. 4. According to Sir Astley Cooper, the operation is possibly done in such and a half from the abdominal ring, except in three cases, when it is nearer to it. The parts having been reduced together, and retained in by means of one or two external and sticking

plaster, which is much preferable to the old plan of applying bandages to the outside and inside of the tunica vaginalis, so as to hold the part by one grasping power.

A new species of hernia, however, has described by the late Mr. Hey, in which a portion is protruded behind the tunica vaginalis, and is contained in the tunica vaginalis. It arises from the parts being protruded after the communication between the abdomen and tunica vaginalis is closed, so that the spermatic is confined down along with the tunica, and forms a hernial sac within the tunica vaginalis. It is sometimes also, that such a hernia can only be produced in the original tunica vaginalis remains, in the form of a loop, as high as the abdominal ring. Operation should be made of the possibility of having a sac to drive into during open the tunica vaginalis.—See Hey, *Medical Obs.* p. 224; Dr. Rutledge, in *Ann. Med. Juris*, No. 67, p. 484; and Sir J. Cooper's *Work on Inguinal Hernia*, p. 224.

INTERNAL HERNIA, OR ECTOPYCAE.

The exemplar, or internal inguinal hernia, is so called from its situation, and has the same basis as the external, contains a portion of intestine, or omentum, or both. In old medical writers the quantity of omentum is sometimes very great. Mr. Hunter says, that he found them also a small portion of testis in one of them, with about a third part of the omentum, not adhering together. Mr. Guy and Dr. Keene found the liver in the sac of strangulated hernia; and Bichat says that he observed. He observes also the contents, they are originally contained in the sac formed by the protrusion of the membrane. In recent and small herniae this sac is very easily felt in an old and large one, it is broken through by the heat of the finger, by the pressure and weight of the contents, and is not always to be distinguished, until the hernial ring it has by some been broken, when the kind of rupture has a hernial ring as well.

Infants are very subject to this disease, it is most frequent from the expansion of the uterus; but in general they pulled out of it so they escape, or are easily cured by means of a poultice. It is of still more consequence to get this disorder cured in females, than in males, for if it remains, they are become infertile and pregnant, may be produced as much as possible, for at this time of life, before the too great distention of the uterus, or from the guarded motion when the parts are upon the weak, during position it is often very troublesome, but in delivery, if the contents have contracted in albumen, they will often strangle, and may be kept in this way by a proper bandage.

If such bandage was always put on as it is, and worn constantly, the disease might be cured of any within moderate bounds, and some of the very best consequences which often attend hernia prevented. The woman who has the smallest degree of it, and who, from her age and situation, left certain children after its appearance, should be particularly careful to keep it contained.

In some instances of the sac it is large, and is much easily reducible; in others they are small, and in some absolutely irreducible. Of the latter kind who have been operated for, value for a proper bandage, and given little or no trouble. They are not different with this disorder, who are observed in life, and in whom it is large, and generally subject to inflammation, and, if the inguinal canal is at all enlarged, to very troublesome swellings. Others, however, are often supposed to labour under a tumour when they really do not. It therefore becomes such a task to find out, to keep the tube as clean and free as possible, and neither to eat or drink any thing which may be dangerous to that part.—See on Hernia, vol. 2.

Authors who have published since the time of this celebrated surgeon, have not added much to our stock of information with respect to this disease, the exception is. The writings of Sir A. Cooper, *Opera*, *Treatise on Hernia*, p. 327; and all the other modern writers confirm the fact described by Port, that in the inguinal inguinal there is a hernial sac, just as in a common inguinal or scrotal. Every one acquainted with anatomy knows, that behind the opening in the linea alba at the umbilicus, the peritoneum is complete, and consequently

total protrude along with the viscera in cases of strangulation. In the early days, about thirty years ago, it was not a deficiency of the ring, the weakness of the ring partially absorbed in ligament, so as to allow the protrusion of the contents, and therefore, from this cause, a hernia occurred. Similar appearances, however, in the expected, produce give rise to the rupture in infancy mentioned by Blandin. De la Paire, Gossageot, and J. L. Petit, that, in the umbilical hernia, the peritoneum was always ruptured, and there was no hernial sac. According to Ricard, early infancy is more subject to the umbilical hernia, directly so called, in which the peritoneum protrudes through the ring; while in the later periods of life we never find it with any degree of rupture, or such as occur in the rupture of the umbilicus. (Harcourt's *Chir. de l'Enfant*, p. 2, p. 215.)

Butler is of the opinion, and the explanation is also covered by a more scientific explanation, consisting of condensed cellular substance. In operating, however, a hernia should always cut with great caution; for the peritoneum will hernial out in front of the incision and immediately adhere; and, moreover, in large cases, when an abstraction of part of the sac has been raised by the pressure of the abdomen, they are even found adhered to the integuments.

Urgent hernia, and discolored and complete strangulation, are particularly liable to be misdiagnosed. In such cases, when there is fulgidity in the eye, considerable general symptoms. The pressure on each side of the tumor is observed to be particularly firm, and the skin is discolored, but the heat of the tumor is not sufficiently pronounced, and upon the surface has been found no rupture in the wall. (See *Lancet* on *Hernia*, p. 24, 1850, &c.)

In the case of hernia, the symptoms are such by the position occurring in the last case. Let us now consider the inguinal hernia, the more particular form in which it has been noticed by the late writers.

INGUINAL HERNIAL HERNIA.

In children, but not with about two years of this kind usually for the space of eighteen years, and they strictly observe the epigastric region, as they appear at birth. The fluid is in a sort of bag, containing some of the viscera, which pass out of the abdomen through an opening in the thickness of the ring. The opening is self-sealed with skin, so that the contents of the hernia can be seen through the thin distended covering of the cord. The disease is owing to a congenital deficiency in the abdominal muscles, and the hope of cure will be regulated by the size of the excision, and quantity of viscera protruded.

The plan of more proposed recent of the employment of a ligature, or of a bandage. The latter is more preferable, and was proposed by Mr. Hey, as follows: having reduced the intestine, he desired an assistant to hold the fluid compressed sufficiently over the abdominal ring to keep the bowel from returning into the hernial sac.

"I procured (says he) some plaster spread upon leather, cut into circular pieces, and laid upon one another in a circular form. This composed I placed upon the hernia, after I had brought the skin on each side of the opening into contact, and had laid one of the lips a little over the other. I then put round the child's abdomen a flannel belt; and placed upon the neck a thick, elastic, quilted pad, firm as a brick, two inches from one extremity of the belt."

"The bandage kept the intestine securely until the abdomen, and was applied immediately. The next was separated about a week after birth, and at the expiration of a fortnight from that time the operation at the umbilicus was performed, and the crying of the child, when the bandage was removed, did not excite the least pain. I thought it proper, however, to continue the use of the bandage a little while longer. A small excision, five lines deep, produced, when the fluid had dropped off, about half an inch from the ligament of that depression which the ring forms. A piece of the ligament with great care was cut out, and secured by the pressure of the bandage, brought in a complete cicatrization." (A. 177.)

This gentleman has referred another example, in which the ligature was quite successful, and is

dated, the one having been in delivery. The parts were reduced; but the child died.—(See also *Ed. J. Pract. & State Medicine*, 1844, under other diseases of the umbilicus. August 1851, [See p. 38].)

INGUINAL HERNIA IN CHILDREN.

The inguinal hernia, which is sometimes formed in the fetus, from causes difficult of explanation, takes place in other instances, at the moment of delivery; and thus, as Schöler remarks, should it be tied by mistake with one thread, death would be the consequence. Most frequently, however, it is not till the second, third, or fourth month after birth that the disease occurs; and the reasons are various. In the first years of life, if the viscera are attacked with this hernia, because affected at the periods just mentioned.

The children, with open, torn ligament in contrast, so as to allow the viscera, which have found an opening capable of protruding a protrusion of the viscera. Sometimes, however, the opening exists of the child, and the viscera protrude the opening, and then the closure of the covering of the ring is prevented. By degrees, the unobstructed opening becomes more and more dilated, the protrusion of protruded bowel increases, and the viscera, which, from being of fetal size at first, at length attain the size of an egg, or like water, and pressure itself with all the elastic force of a hernia.

The protrusion of a portion of intestine and contents in the hernia, keeps the umbilical open, and sometimes a partial weakness which it has to close. Such weakness, however, being sometimes superior to the resistance of the protruded parts, forces them back into the abdomen, and thus the opening through which they passed, and then the spontaneous cure of the umbilical hernia in children is accomplished. Two circumstances of this fact are related by Ricard.—(Harcourt's *Chir. de l'Enfant*, l. 2, p. 215.)

Nature, however, does not effect every such cure, and when the cure is left to her alone, she not only fails in securing about a useful cure, but gradually renders it impossible. In short, the propensity of the opening to close disappears, and is lost in the subject grows older.

Thus, an umbilical hernia of children seems to be essentially different from that of adults, in the tendency of the opening to contract. Hence the rule of effecting a radical cure in children, and the direct upon responsibility of doing so in adults. In the former, it is enough to keep the intestine from protruding, and the opening becomes of itself obliterated; in the latter, the opening always remains, whether the hernia continues to it or not. This independence of the opening to contract in the adult, also, depends upon the protrusion not being through the umbilical ring itself, but through a fissure in the vicinity of it, not united with the same natural tendency to close, which the umbilical possesses in young subjects. In fact, it would appear from the observations of Scarpa, that unless a given pressure has had the protrusion from hernia, it never occurs exactly through the umbilical ring itself.

The means of curing the umbilical hernia of children, are compression and the ligature. The former is the most common; the latter the most ancient treatment, as it is mentioned by Celsus. The object of both is the same, viz. to prevent the lodgment of the protruded viscera in the opening of the intestines, and thus facilitate the approximation of its sides. To accomplish this end, the ligature encircles the hernial sac, and the skin pulled before it; and by the action of the cure, a cicatrix is produced, which secures the protrusion of the viscera. At the same time, the skin of the hernia, when their natural tendency, compresses them the tendency in opening, in the period of the abdomen, hinders the protrusion of the bowels, and keeps these parts from meeting the contraction of the ring. Ricard remarks, that through compression, as well as by the ligature, during the great length of time in which it is necessary. The ligature (the skin) produces permanent gain; but it is not at all violent, and it effects in a few days, what compression, when successful, accomplishes in several months. In such plan, long and continued attention is requisite, and if its employment be only for a short time, the effect the previous effect becomes almost destroyed. The other method accomplishes its object with

for those accidents, enjoyed, indeed, the greatest perfect health in every respect.

"Whenever persons are obliged for trying the method herein, it is evident that the patient can only be considered as far as a man, and on this side of the operation, long as the weakness, whatever it be, exists, and the instruments must always remain placed and related to a certain point, as the time and the circumstances of this operation. Also, after the operation of the strangulated person, take necessarily measures under the cloth, a person on the lateral side, and in the lying instrument which involved it, and as the chronic itself is not supposed without distress to make the impulses of the exterior, which tend to separate themselves from the remains of the hernia, and the hernia, some or later happens, and in a short time becomes larger than it was before the operation. If the subject is a little girl, it may be apprehended that the first pregnancy will cause a recurrence of the hernia; so, it is happy that during pregnancy and maternal remains of the weakness is considerably diminished, and much disposed to give way."

Scarpa then remarks, that "after the operation of the hernia, there always remains between the abdominal ring of the hernia and the adhesions a small cavity formed by the neck of the hernial sac, a cavity into which the viscera begin to infiltrate themselves after the operation, as so to kindle the complete consumption of the ganglionic sac. The demonstration of what here is intended is, it seems necessary, to be based on the method of operating on the inguinal hernia, not in a strangulated state, by the separation of the hernial sac and epineurial coat. Many of the hernia operated upon by this method, proceed from subject to relapse, because, in this proceeding, the clitoris was not sufficiently firm to resist the impulses of the viscera, which entered the remains of the hernial sac. In the same manner, after the operation performed for the strangulated inguinal hernia, although the clitoris is found very firm the ring, there is no prudent surgeon who does not advise the patient to wear a bandage the rest of his life, observation having proved that the hernia is still liable to recur."

"The existence of hernial sacs, in youth, that compress above is an extremely dangerous method of relieving the mechanical hernia of young persons. It is attended with serious and, provided it is associated with the inguinal hernia, it is hardly ever necessary to continue it longer than two or three months for the purpose of relieving a compression. On the other side, if it be actually proved by all that I have been observing, that the ligature never admits of a perfect cure without compression, it is probable, that if it cannot be so advantageously for the relief of the hernia, some advantage cannot be derived from it. It may be said, that, in general, it does not shorten the treatment; so, in the least momentous cases, the subject may be less troubled by less than a month, and, therefore, make the cure critical, instead of compression must afford no benefit, by reason of a hernia, the viscera larger. It has already been stated, that three months are commonly sufficient for achieving a radical cure by the more employment of a compressive bandage."—(Scarpa, *Treatise on Hernia*, p. 344-349.)

M. Girard published a dissertation on the medical hernia of children, which was read to the Medical Society of Lyons in May, 1811, and the object of which was to recommend compression as an efficient means of cure. The arguments used were very flimsy in those advanced by Girard. In the course of the discussion, M. Carles observed, that he had seen many children operated upon by Denon, who were cured of their hernia.—(Scarpa, *Opusculum*, p. 344, 345, 346.)

The subject now proposed takes up by the Medical Society of Paris, and the result of the debate was, that the employment of the ligature must be rejected. 1. Because the cure of inguinal hernia is often accomplished by nature alone. 2. Because compression, either above or below, causes, sometimes, serious accidents. 3. Because the operation of the hernia does away the means, in regard to being painful, and sometimes dangerous, if unfortunately a piece of intestine should happen to be included in the hernia. It was recommended in general, except with the assistance of compression, of being sometimes necessary, par-

ties, as Denon himself gives the instance of. An instance of M. Carles, the insufficiency of his ligature was long afterwards acknowledged by Denon, *loc. cit.*

The treatment by compression is generally preferred by English surgeons.

INGUINAL HERNIA IS AVOIDED BY LIGATURE.

This case is well treated by the principles common to all surgery. When operating, the patient should be kept upon a bandage or truss, which puts, however, upon a position, which is best of a truss. Mr. Key has described some very good reasons for the operation, which are applicable to children, when compression is performed, as well as to adult subjects. These are recorded by the late Mr. Mahon, an experienced anatomist at Leeds.

"It consists of two pieces of this elastic band, which encircle the sides of the abdomen and loosely fasten behind. At these extremities carefully they form exactly as one ring, to one side of which is fastened a spring of steel of the form represented. At the end of this spring is placed the point of a thin piece of wood, which is placed in every position of the body, and is thereby retained constantly within the abdomen. A piece of elastic or iron is fastened to each side of the metal ring, having a continued loop at its ends, through which a piece of tape is drawn, that may be tied behind the body. This contrivance helps to preserve the abdominal steady in its proper situation."—(Practical Observations on Surgery, p. 211.) And, in the second edition of the preceding work, Scarpa gives the description of the operation of Mr. Mahon, of Leeds; but, no name is given of this instrument, with an engraving in the last edition of the *First Essay on Surgery*, it is not now given the description.

When the compression is immediate and large, the truss must be supported with bandages.

It is observed by Scarpa, that the inguinal hernia, and those of the femoral vein, are less subject to be strangulated than the inguinal and femoral hernia; but that, when they are unfortunately affected with strangulation, the cure was less easy, and the operation more on more rapidly, than in every other species of hernia. If the operation be performed, the event is frequently unfavorable, because it is generally done too late. This practical fact is proved by the experience of the most celebrated surgeons of every age.—"It is certain," says Bland, "you do not operate it as you should, and it is not so favorable."—(Essays on Operations, p. 98, et seq., and *Journal de La Faculté*.) The same adds, that they who have the misfortune to be affected with an inguinal hernia, should rather dispose with their shirt, than a bandage. He then nearly the same thing.—(Practical Observations, p. 211, 212.)

When the operation above is strangulated in the inguinal, or hernia of the femoral vein, observation proves that the operations are not so favorable than when the hernia is also strangulated. There is this difference, however, that when the operation above is strangulated, very serious accidents, and, if entering should likewise take place, it is less frequent and violent than when the femoral itself is strangulated. In the first case, the accident hardly ever extends beyond the protrusion of the stomach in, or death, the reason why the strangulation of the operation in the inguinal hernia occasions the more intense symptoms of sympathetic irritation than the strangulation of the same vessel in the inguinal or femoral hernia.

Then the operation is not only always necessary, but usually required. It is not materially different from that which is performed by strangulated inguinal and femoral hernia; but, in general, it demands greater compression on account of the contraction, it is a more tedious, which frequently arises between the inguinal and femoral sacs, and after the adhesions which often grow between the latter part and the operation which it contains. The situation of the fundus, which is frequently exposed by, and enveloped in, the operation, is another circumstance directing correct attention.—(Scarpa, *Treatise on Hernia*, p. 351, 352.)

Mr. Ford, in his book on the operation in cases of cancer, observes, "The medical, and the surgical way, because the nature of the operation, with the

[illegible]

IBERIA: CHERRE, *Scopas* Desv., *Europae* (coll.) There are two principal kinds of Iberia (cherre); one presents itself in young infants; before the ossification of the skull is completed, the ether takes possession of the dissection of a part of the skull by the operation of the trephine, artificial violence, or otherwise.

The magisterial beauty of the illustrations, however, is in two very different forms: in one, it is created by the seals; in the other, the corresponding image results if the head and sometimes even the foot prints, are inked.

The cutaneous exfoliations, seen in this case, were more extensive, seemed to originate from the imperfect ossification of the skull, especially in the situation of the frontalis and occiput. This view is characterized by a well-marked, of an equal sized shape, which is attended with a pulsation corresponding to that of the pulse; it yields and disappears under pressure, offers no alteration in the colour of the skin, and is circumscribed by the margin of the defective portion of the skull. (Forrest, in *Ann. de l'Hôp. de Chir.* t. 12, 1804, p. 302.) In general, the morbid facies are not affected; and the mind is unimpaired, in which a patient just such a horrid boy has lived many years, exhibiting his facies from early being born impaired during the whole of that period. (*ibid.* p. 3, v. 1, p. 302.)

It is naturally well understood, that the compensation justice would, which arises from the isoeconomic condition of the skill, and is required by the public, ought to be treated by the application of economic, yet labor-saving, means. M. Hoffmann is recommended to the Royal Academy of Surgery in France on account of the good effects of this treatment, which reduces the size of the tumor, and accomplishes a perfect cure.

mean as the construction is completed. M. Saltenevskii, a plover of this short head, properly covered with soft down, under the chicks' caps, to which it was suited in a suitable situation, and the degree of pressure was increased, or lessened, according to circumstances required, by tightening or loosening the cap—(Ost. cit. p. 202, t. 12, of Mus.)

The experience of Gallows also confirms the fact that human conduct, when of a selfless type, may be moved by the foregoing method, the quality becoming gradually altered. That is, able, that large majority of his presence, especially when situated about the subject, actually admit of any number of relief, except the employment of more conventional to protect them from external injury. (Gallows, *System*, *Key*, *Hebrew*, vol. 2, p. 312, 314, c. 1280.)

When the infection of the uterus is chronic, it is late, the discharge, as well as the ovaritis, is liable to persistence. In 1892, two such cases occurred at Paris. In one, Professor Lannelongue removed the uterus for carcinoma, and encountered an abscess of its cervical orifice. After taking note of the anatomy acquired, his proceedings were stopped by him, seeing the white stony mass of the new cancer, and that the abscess came out of its position in the cervical horn. Today after the operation the abscess was found with larger pain in the fund, had a hard wall, protrusion of strength, vomiting, &c., and died in the course of a week. On dissection, a part of the fundus, and an abscess of two two inches in the thickness, alone as large as a nut, were found in the protruded end of the dark matter. Several abscesses were also discovered in the substance of the cervix. The other example (2) was the consequence of M. Hugué, principal surgeon to the Hôpital des Epaves. Upon the death of the child, the abscess extended almost apically—(Chirurg. Néonatal, Clin. 2, p. 289, of 4).

Both facts should reach the airport to be particularly distressing is re-evaluating the value of insurance about the back part of the head, before the ventral, to increase their survival.

The second kind of compound encephalocoele is that in which not only large portions of the cranium, but also more or less of the integuments of the head, are deficient. It is usually to be regarded as a malformation, rather than a disease, and, indeed, in most instances, the infants live wellborn. The case mentioned consists of the presence of most of the brain through the inferior and posterior foramina, so that the child is born with a large opening, the back of which, hanging down over the posterior part of the neck. Several specimens of these malformations, taken from infants born in the Hospice de la Metairie, are preserved in the museum of the Faculty de Médecine at Paris.—(*Archives, Néerog. Chir.* t. 2, p. 216, col. 4.) In the year 1816, a remarkable case of this kind, with description of congenital *Sinus cystos*, was published by Dr. Barrois. "The whole of the forehead, vertex, and a great part of the occiput, were deficient, and in lieu of them, a substance composed of a lightish fleshy colour, and of the consistency of wax, except that it was proportionably broader. From the deficiency of bone, the eyes appeared to project much more than usual. The child lived six days without either taking sustenance, or having any excrement." On dissection, the scalp, the os frontis, the parietal, and a small part of the occipital bones, were wanting. Through the parietis, which three leaves were deficient, the cerebrius projected, exhibiting the usual *gyrificationes*. It was covered with the pia mater; none of a milky colour; appeared to be more vascular than the pia mater usually is; and the edge of the scalp adhered to the neck of the tumour. The cerebrius was not taller than one-fourth of an inch high; on the posterior part of the os occipitis was much more in the form of a tumour than usual. The child was destitute of the power of voluntary motion, and after the treatment applied, he stopped.—(*Ibid.* *Chir. Franç.* vol. 4, p. 52.)

The most interesting species of *hemia* contribute the paradoxical, in that, which sometimes occurs after the removal of a portion of the shell by the coralline, or the destruction of part of it by the stone. You can examples of this disease are recorded in the *Mémoires* of the French Academy of Surgery, and I have myself seen such instances of it. Although the case has

attracted considerable notice, recent surgeons are in favor of performing similar operations concerning the excision of the lamina.

In one example, recorded by Mr. Abernethy, the hernia rendered acute on the fourth day after birth, and was as large as a pigeon's egg. The pia mater, covering it, was inflamed, and a white serum was discharged at the sides of the swelling, near beneath the dura mater. On the seventh day, the patient was as large as a hen's egg, and still ready to burst. The next day the work day. On examination, the swelling was found still larger, and of a dark color, with an irregular protruded surface. The appearance was owing to congested blood, which adhered to its surface, as the part had been so much that the patient's cap was rendered quite stiff with blood. The pia mater was in general much inflamed, and, as well as the dura mater, was detached at the place of the hernia. The deeper part of the swelling seemed to consist of coagulated blood, and it was found to originate about an inch below the surface of the brain.

Mr. Abernethy explains the formation of the disease as follows: "In consequence of the brain being situated so low beneath the surface, disease of the vessels and consequent effusion of the blood had ensued: the effusion was, for a time, restrained by the expansion of the brain and its contents; but, those gradually yielding to the expansive force exerted from within, and at last giving way altogether, the fluid blood coagulated and condensed upon the surface of the brain." An organized fungus can hardly be produced so rapidly as these tumors are formed.—*See Journal of the Medical and Surgical Review, vol. 2, p. 36.*

On the contrary, Mr. C. Rich declares, that the swelling is vascular and organized.—(*Operative Surgery, vol. 1.*)

Dr. John Thomson also entertains a different opinion from that of Mr. Abernethy, respecting the mode in which these tumors are formed; but I question whether he may not have confounded with the disease now under consideration, fungus tumors of the dura mater. At least, several instances to which he alludes, as a reason for his sentiment respecting their mode of formation, must have been the fungus as well described by H. Joubert.—(*See Brain Matter.*) The reader, however, must judge the himself from the following passage:—"It is a considerable number of those who had the cranium severely injured, or fractured by some other cause (Mr. Thomson), fungus grows thick place through the openings which had been made at that by the ball, or afterwards by the surgeon. These growths, I am inclined to believe, are the consequence of a solution of the substance of the brain, and of the exposure that border it, which gives rise to the formation of a new organized substance, different in its texture from brain; and also, as some late writers make endeavor to persuade us, highly putrescent of the brain, resulting from the removal of the natural substance, which is replaced by the dura mater and contents. I have known instances of inflammation, similar to these growths, forming on the surface of the brain, immediately under the place where the cranium had received a laceration, or even in which the tumor had not been applied, or any portion of the cranium exposed."

Persons of the brain, in the greater number of instances, in which it has an opportunity of observing it, was accompanied either with tumor or fungus, and with symptoms of congested brain. In a large case of the tumor of the cranium, produced by a swelling left, and followed by a fungus of the brain, the fungus took place in the lower extremities. In a case of tumor, given by a surgeon to the right side of the forehead, and in which several of these had been found in most the brain, a large fungus protruded. The fungus of the forehead was followed by the fungus, which, situated under the skull, protruded, and the portion of the brain. In the present of the case, excision was made to the fungus, portions of it were sent off by the patient, and all of it that was exposed to the cranium was being poured off by the knife, with an incessant absorption, rather than suppuration, of the symptoms. In the death of this patient, nearly the whole of the right hemisphere of the brain was found converted into a soft pulpy mass. The left

hemisphere was not changed in structure, though with vascular impregnation appeared on its surface.—(*See Dr. J. Thomson's Report of Observations made in the Military Hospital in Belgium, p. 75, 28.*)

From the observations of Mr. Stanley, we are placed beyond all doubt, that a part of the brain is actually associated with the substance of the tumor, and he thus confirms the opinion formerly maintained upon this point by Quain and Ligon. This, in the first case with Mr. Stanley has occurred, "the whole of the brain was sliced off with a scalpel. During the operation, the boy gave no manifestation of feeling pain, although not unconscious of what was being done. Considerable hemorrhage took place from the surface of the brain, exposed by the removal of the tumor, the blood being thrown with great force, and to a considerable distance, those numerous vessels, which were attempted to be secured, but ineffectually by ligatures. After a short time, however, the bleeding ceased. On examination of the part, which had been cut off, the exterior was found to consist usually of a layer of the organized blood; the rest of the substance of the brain, presenting a natural appearance, the distinction between the cerebral and medullary matter being easily seen, with the convolutions and pia mater lying down between them." In the description of the death, "all that part of the dura mater subject to an abnormal aperture, through which the tumor had protruded, was black, bloody, and much thickened. The exposed surface of the brain, from which the tumor had been cut off, exhibited a somewhat red brownish surface; a state of degeneration, which extended deep into its substance. About an inch of red and dark-colored fluid was found between the dura mater and the exposed surface. Several small effusions of blood were met with, both before the operation and in the substance of the brain. The arachnoid membrane was thickened and congested with hemorrhage. The vessels on the surface, and in the substance of the brain, were remarkably full of blood. The lateral ventricle was large, and filled with transparent fluid, and there was some fluid between the membranes in the base, and, deep half, the quantity from these two sources was very little soluble."—(*See Med. Obs. Trans. vol. 3, p. 15-17.*) In another description, a considerable quantity of purulent fluid was in the arachnoid membrane, in each lobe of the brain.—(*See Med. Obs. Trans. vol. 3, p. 15-17.*) In most of the cases of tumor of the brain, which I have seen, the patient was in the acute period of the disease, but, however, under the influence of the operation. The tumor, paralytic, and some symptoms of congested brain, noticed by Dr. J. Thomson, did not take place till the latter stage of the disease, and then consisting of the paralysis and weakness occasionally observed.—(*See Med. Obs. Trans. p. 28.*) The disease is usually attended with great frequency of the pulse.

With regard to the cause of the protrusion, it is a subject very difficult of explanation, because if the origin of the tumor depended simply on the removal of a portion of the skull, or on any changes of the dimensions of the brain in expansion, the tumor would always follow such causes, and proceed in all patients. From the particulars of the description, performed by Mr. Abernethy and Mr. Stanley, and those related by Dr. J. Thomson, it is given, that the tumor would be a disease associated with depressed changes throughout a great part of the brain.—(*See the Large, Med. Obs. Trans. vol. 3, p. 15-17.*) The symptoms of the tumor in fatal cases are not pain and degeneration: after death large effusions of serum, and signs sometimes of blood, and paralytic action, are observed. These appearances have led some to the disease being associated with inflammatory action within the brain. It is highly probable, however, that a tumor would be only produced when there depressed changes are combined with the removal of bone. The changes alluded to may be supposed to exist in the increase in the great vessels of the skull, and thus a disposition to protrusion, as rapid as the tumor and other fluids are effused. This statement, however, can only be received as an hypothesis, for we do not find, that in case of the disease, described by Mr. Stanley, there existed a considerable space between the upper surface of the right hemisphere, all around the margin of the parietal and the lateral surface of the right outer table, in every other part, the internal table

and inflammation, this affection may be removed by applying the later planter soap, containing a large quantity of Winc. Some persons are often annoyed with this disease. According to reports, this is most frequently owing to a morbid state of the person (i.e. that one with a person who has an arid imitation, and a cold in the mouth, spiritus—*Chapman's Medical and Surgical History*, v. 2. See also *Practical Operative Surgery of the Eye*, p. 207, &c.)

INFLAMMATION OF THE GASTRIC MUCOSA.—*Inflammation of the Gastric Mucosa.* A further and partial species of gastric pain, or rather a combination of this affection with gastric ulceration. It is particularly characterized by the continuous or interrupted nature of its disposition to attack stomach, or ulcers, in crowded hospitals, or other situations, where, owing to these causes are brought together, and to the agency to remove the web partly affected by a gastric pain, or gastric ulceration, is taken on from its original nature. It is described—(*Practical, Foreign, French, and Med. Chir. v. 121*). It is generally believed to be characterized from its course or trend to another, by its local pain nature; but, whether the nature can be transferred only by actual contact, or by the way and through the medium of the atmosphere, is a question on which the most widely differ. The first origin of the disease, however, is a mysterious subject, which cannot possibly be explained so far as to admit of any principle, as will be hereafter noticed.

Thus, the description of Mr. Blackadder, it appears probable that several of the ancient writers, in their descriptions of that mysterious bleeding ulcer, must have alluded to the character of disease which is more nearly characteristic of gastric pain. Besides this use of the term gastric, which, according to the modern French writers, is the most correct of describing this morbid, several of the modern writers also have employed the term gastric ulceration, as, for instance, *Alton, Pallas, Kollmann, Avicenna, Galien, &c.* The only doubt whether these authors actually referred to local gastric ulceration upon which was being formerly described by the modern writers. But on this point, I recommend Mr. Blackadder's valuable treatise to be consulted.—(*P. 121*).

Although La Motte published a system of hospital hygiene in 1722, under the name of *hygiène*, and stated that it was derived on the 18th of June of Paris, the first distinct account of this disease is contained in the 3d vol. of the *Transactions* of the Académie, published in 1763. In the year 1766, Dumas, who was elected President of the Académie of the Hôtel-Dieu at Lyons, also published a short treatise on the disease. The first very accurate description of hospital hygiene in the English language appeared, in the 9th vol. of the *Lancet Medical Journal*, printed in 1766. The account is entitled, "Observations on the Fever of the Hospital, by Mr. Gibber, surgeon of the Royal Navy." In the notice of Dr. Keil's works on *De febre*, published 1767, there is a section on this subject, entitled, "A clear account of a morbid fever, arising on some, and of the method of destroying it." In 1780 Mr. Gilbert Blane, in the third edition of his book on the Diseases of Soldiers, gave an account of hospital hygiene under the name of *typhus* (short), and Dr. Ferrius, in the 3d volume of his *Medicina Militaris*, published in the same year, described that affection by the same appellation. In the third volume of the same work, Dr. Ferrius added to his first account several valuable communications, relating to the disease, received from surgeons of the royal army. Mr. John Bell also made hospital hygiene the subject of particular notice in the first volume of his *Principles of Surgery*, published in 1801. According to Dr. Thomson, new excellent names were first published in at the university of Edinburgh, the first entitled, "De Gastritis Continua," by Dr. Leslie, in 1811; the second by Dr. Charles Johnson, in 1815, under the title of "De Gastritis Continua Nuncupata."—(*See Lectures on Inflammation*, p. 456—458).

Previous Thomson's account of the subject, published in 1811, translated the 18th January of the disease at that time noticed. After afterwards gave a very fair account of the *typhus*—(*See French Med. Chir. v. 1, p. 226, 228, 229, 230, 231, 232*).

These descriptions were followed by the valuable notice of *Hospital*, entitled, "Mémoire sur la Contagion

des Foyes et des Ulcères vésicaux, par le nommé de l'Amateur d'Hôpital," 1810; some interesting observations by Dr. Huxham, in the *London Medical Repository* for March, 1810; a paper by Professor Broussais, of Leyden, in the "Annalen der Medicin Med." vol. III, 1812; and the treatise of Mr. Blackadder, which contains some of the best accounts of the disease occurring in an affection, and is entitled "Illustrations of Phlogistic Gastritis," from London, 1816. To these publications one is to be added the interesting remarks of Mr. R. W. Black on *Shocking Typhoid*, contained in the seventh volume of the *Med. Chir. Trans.*; and those of Dr. Budge, inserted in the third volume of the *Ann. Med. Chir. Trans.*

According to Mr. Blackadder, who is a literary in the domain of the complaint long ago expressible by the direct application of the infectious matter, when the morbid matter which produces the disease, has been applied to some part of the surface of the body, from which the morbid has been removed, as by a blister, cut, or such small vesicles that appear, which are filled with a watery fluid, or bloody serum, or a red or reddish-brown colour. The situation of the vesicle is generally in the edge of the pore. Its size is not unfrequently that of a split garden pea, and is easily detached, the pellicle which covers it being very thin. When the vesicle is filled with a watery fluid, and has not been ruptured, it exhibits the appearance of a greyish mass, or red-coloured dough; but when it contains a dark coloured fluid, or has been ruptured, it presents the appearance of a thin, confluent of blood, or a dirty brownish black mass. During the formation of the vesicle, there is generally a change in the sensation of the skin, some patients within periods feel like that of burning of a fire.

After a vesicle is formed, it spreads with pain, or less rapidly, until it occupies the whole surface of the original sore, and soon left to itself (which seldom happens), there is little or no itching, but the slight itching daily greater thickness.

When the formation of the disease has been interrupted, the stage sometimes becomes more frequent and more phlogistic, sometimes gradually subsides; and such is frequently the rapidity of the progress, that even in the course of a few hours, a very extensive inflammation will be formed, while the parts in the vicinity remain their usual healthy appearance. The morbid, the edges of which are well defined, is filled with a thick, glutinous matter, which adheres strongly to the adjacent parts. When this matter is removed, the surface appears presents itself of a fine granular texture, which is almost all features, impregnated of extreme sensibility, and is very apt to bleed when the repetition of bleeding is not performed with great caution. At each decision the character of the disease is found changed, and if there are more than one, they generally run in each other. The progress of the disease is much quicker in some individuals than others, but it never ceases until the whole surface of the original sore is occupied. The stage sometimes previously becomes of a dusky or burning kind; and after about the fourth or fifth day from the time when the morbid matter has entered by the skin, or otherwise, at the period of what may be termed second, or inflammation, the symptomatic vesicles and glands are apt to become affected. The discharge becomes purgative, its colour varying from a dirty yellowish white, to a mixture of yellow, black, and brown, depending upon the quantity of blood mixed with it.

The most parts in the immediate vicinity of the sore, daily become more painful, tender, and inflammatory; and a great number of cases, particularly in those of phlogistic and irritable habits, an attack of acute inflammation spreading superadded, and is accompanied by a great increase of pain, the sensation being described to be such as if the sore were burning. The period at which this inflammation begins to subside is by no means regular. Sometimes it subsides in the course of two days, and sometimes it continues upwards of five, depending very much on the constitution and previous habits of the patient, as well as the treatment that has been adopted. During the progress, the skin, which looking red frequently swells along which is formed on the skin, becomes more and more thick, and of a greyish consistency. Hence the form of disease is partially covered by green, yellow, greenish. In the course of a few days a very extensive

able in their descriptions of the state of the tongue. Dr. Wilson found it brownish or blackish; Depaul, whitish or yellowish (*Praxis Med.* t. i, p. 125); and Mr. Blackadder, covered with a white spot.—(*P.* 22.)

It is related by Mr. Blackadder, that when the disease attacks a large vessel, the whole surface of the tongue is immediately affected from the first; while in other instances, the disorder manifests in a spot, the size of a pea. When the patient is of an inflammatory diathesis, the sore is generally attended with acute inflammation between the second and fourth days; and the tongue is swollen and of a gummy consistence; matter of a strong and profuse colour, and of a dirty yellowish gray colour, begins to issue out at its edges, and becomes daily more copious. The inflammation gradually subsides, the slough becomes brown and finally detached, leaving the subjacent vessels, nerves, &c. exposed, and the slough is completely exposed. When the constitution is not prone to acute inflammation, the slough assumes long placement; the discharge is very copious, and increases as the slough, which flows northward, diminishes, until the detachment of a single, hard projection, rising up with notwithstanding a slight recurrence of the phlegmatic discharge, the parts laid up by the almost incessant operations of nature. However, most commonly after the matter is exposed, they continue to be gradually absorbed, their connecting cellular matter is completely destroyed, and they are left covered with an extensive fleshy-looking surface.

According to Mr. Blackadder, when a necrosis has been created, it yields sometimes to a great cure, and quickly restores the occurrence of a large quantity, being altogether deprived of vitality. When a tumor, however, is created, but has become inflamed, it generally acquires a pale colour, with an appearance as if it were covered with a fluid, and occasionally before being mortified, acquires a very surprising look—but when an inflammation supervenes, the proper location of a pure bright color, wears away daily, and the patient loses all power in them. As the disease advances, the integuments are undermined, and finally, and sometimes from small vessels, a common occurrence, but in a more advanced stage, some of the large vessels are apt to give way, and the bleeding from them frequently destroys the patient.

When a stasis is the case of the disease, and the patient is of a phlegmatic habit, or considered as free from the symptoms now begin to indicate the existence of an intense inflammation, arising through its whole substance, the transference, pain, and heat incommensurably, so that in a few days, the slough shall have enlarged more than twice its former size, being at the same time again increased, and causing the most excruciating pain. In this state, the patient has, in some instances, become delirious, and has been cut off by an effusion taking place into some of the larger vessels. It more commonly happens, however, that gangrene supervenes upon the inflammation and cellular membrane large sloughs are thrown off, and some of the large blood vessels giving way, the patient sinks under the effects of repeated hemorrhage. For it is commonly found, that the usual means of stopping hemorrhage from a stasis, are, in such cases, either ineffectual or totally inefficient.

Sometimes the progress of the disease is a stasis, in more gradual, but in the end nearly as mild; the inflammation is now in low state; there is comparatively but little transference, and the pain is much less violent, but the discharge is much more profuse, and the cellular membrane subsiding, the transference and matter is rapidly dissolved. Hemorrhages generally follow on later than in the preceding instance, but it is the most conspicuous of them.—*Blackadder on Phlegmonia Gangrenosa*, p. 22-23.

It is observed by Wilson, that every vessel in the system which receives blood powerfully the degenerative action of hospital gangrene. (*Thomson's Lectures*, p. 139.) A fluid issue at variance with the occurrence of hospital gangrene (*Praxis Med.* t. i, p. 125); but intended to refer, as I conceive, to those in which the disease, instead of other degeneration is seen for several days successively, limited in the order of the progress of the disease, yet not until day. I have seen the same thing frequently observed in rheumatic phlegmonia, as well in the groin as in the arm.

As for the smaller arteries, they are quickly destroyed, together with other parts.

In some rare cases says Dr. Hennen, I have seen the femoral and axillary arteries pulsating violently, and apparently unaffected with disease; while all the surrounding parts were completely destroyed. But in a vast majority of cases the blood vessels partook of the general disease, in which they were involved. They were not only completely separated from their natural covering, but their coats slough away at the immediate point of disease, while the portions remained beyond the apparently affected spot. Hence, our ligatures for aneurism failed on the main trunk, and all my attempt on the artery was invariably fruitless. We were here entirely induced by the use of artery canulas placed above the seat of the disease, and thus were done harm on the femoral, and trace on the axillary artery know the (catheter) the former built on the card, and of the latter on the second day after ward. Dr. Richardson further remarks, that in general the great vessels detached long after the first state of exposure of the disease had ceased, and that, in every case, the critical day of the disease was always decided.—(*The Military Surgery*, p. 227, et 23.) The absorption of the large vessels is slow, when taken upon the femoral artery, appears sufficient to these cases, and the tendency to rapid absorption in the arteries is the staining of the ligatures; the formation of an effusion compression is the softening of the vessel, the whitish green in them, color of mortification, and the general incapacity of nature in examples of hospital gangrene to establish any process which can be considered as ultimately aversive inflammation.

In the last stage of the disease, as it occurred in the military hospitals at Belton, the gangrened tissue was completely covered with bloody mucus, and in lifting up the edge of the flabby slough, the probe was fixed with dark colored granular blood, with which all its track became intimately filled. Repeated and copious venous bleedings were ordered, which rapidly cut out off the patient. The sloughs, whether they did get spontaneously, or were detached by art, were quickly removed by them, and brought into view thickly matted spots of arterial blood. At length, an artery gave way, which was generally too dangerous in the attempt to secure it with a ligature. The hemorrhage, on other pressure, was soon applied, but it was, for while it checked the bleeding, it accelerated the death of the limb, which became profusely mortified and too likely to fall. Inward medicines were used, and with success, in every case, and frequently, down to the "house Officer," however, the patient survived the acute state of the disease, and sank under severe irritation, as symptoms of putrid matter, and extensive loss of action, with common hectic symptoms.—*See Thomson's Mil. Surgery*, p. 237, et 238. In the disease at Belton, the skin and cellular substance around the parts originally and passively affected. This, says Dr. Hennen, was common, even in the living body; but in discussing the disease of these parts was frequently observed to spread much further than external appearances indicated, as a diseased track was often found running up into the groin, or thigh, and completely directing the muscles and great vessels.—(*The Military Surgery*, p. 238, et 239.) When the disease had reached the inside of the chest, the state of the lungs varied in two cases, and the pleurae was a third, colored with purgous matter, and when discolored by the disease had been attacked, the often played the same appearance on the liver.—(*P.* 239.)

Hospital gangrene must be regarded as one of the most terrible and dangerous complications in which wounds and ulcers are liable. When the action of vitality is large, or of long standing, the disorder becomes great, carries, leaves its marks indelibly, and the relapses prove exceedingly obstinate. The same thing is said to happen when it affects persons suffering under aneurism, or venereal complications. Hospital gangrene prevails particularly in the groin, and axilla, when it communicates deep extended wounds, attended with badly fractured bones. All the soft parts of the injured limb are then frequently observed to be progressively destroyed, and the inflammation, follows a vicarous order in typical synapses, frequent hemorrhages, or hectic complaints. From what has been stated, however, the disease varies

neighbourhood, and inevitably destroying the ablest and patients to a large extent."—(*Principles of Military Surgery*, p. 218, of 2.)

The effects of hospital gangrene should be carefully distinguished from those of the disease. There attacked with hospital gangrene are not affected in any degree, like scurvy, when, by the use of vegetable diet and lemon juice; and they occur among men who are not upon fresh meat and vegetables, as scurvy is. They do among those who have been full altogether upon salt provisions.—(*Thomson's Lectures on the Venereal*, p. 482.) Hospital gangrene is always always accompanied with severe febrile symptoms. (See Dr. Ferrius (see Dr. Lind), it may indeed be doubted whether there be any such as are purely and truly syphilitic. The disease is altogether of a chronic nature; and surgery may be fairly resorted to along its advanced symptoms."—(*Treatise on the Syphilis*, p. 200.) In cases of hospital gangrene, the general symptoms of scurvy are also absent, such as swelling and bleeding of the gums, livid tinge to the skin, and the fleshy part of the legs, indolent swellings, &c.

Hospital gangrene (says Boyer) is a species of brand gangrene, when attacks in some degree *spontaneously* the wounds and ulcers of patients who happen to be crowded together in an unhealthy place.

Its essential causes are: the situation of its hospital upon a low marshy ground; the vicinity of swamps, or of the lowlands, the unwholesomeness of the food, such as the stings for their use; the crowded state of the wards, especially when they are small and badly ventilated; lastly, every thing that tends to corrupt the air which the patients breathe. An infected atmosphere may produce in the most simple wounds infatigable changes, partly, as Boyer conceived, by its insensible action on the surface of the wound, but, no doubt, principally, by its partial diffusion upon the whole exposed surface. The long-continued action also sometimes produced striking and extensive progress of an epidemic kind, or, at least, a state of the constitution, under the influence of which all wounds and ulcers eventually take on a bad aspect, and were often accompanied with a most gangrenous character. Appearances such as phagedenic ulcers, or the bloody pus, in the two hospitals of Herculaneum, and he states that the most powerful antiseptic was of little avail against the disorder, which often involved the slightest scratches.

In general, this epidemic species of gangrene is not observed in our best hospitals, but in those which are crowded out of the central parts of cities upon high ground. Hospital gangrene is only seen in any season; but it is most common after the rainy season of winter.

A false constitution, sexual excess, venereal disease, or small festering, venereal disease, gonorrhoea, and, types of a diaphanous type, are also recognised by the French surgeons as its predisposing causes of hospital gangrene.

The investigations of Ferrius, and those of some other physicians, certainly prove that hospital gangrene may be ascribed to the most minute miasmata or even to a subject of the best constitution, and lastly, the great air, by merely making it contact with such wound or ulcer, persons, but, as scurvy, impregnated with the infection of this peculiar disorder. But this insinuation is supposed to be the more alarming, and to have effect the more quickly, its consequences as principal have been more exposed to the influence of miasmata as are themselves capable of producing the disease, and also its propagation to the kind of resolution predisposed to it.

Although the essential nature of hospital gangrene has been generally admitted by all the best informed surgeons on the subject, the description not conceived by Dr. Ferrius as having a good foundation. Modern authors, however, have not joined this latter opinion, and Dr. J. Thomson, Dr. Ferguson, Mr. H. Blackader, and Mr. R. Wilkes, all believe that the disorder is infectious. "The contagious nature of hospital gangrene," says Ferrius (Thomson agrees as to it) is sufficiently proved, for, by the fact, that it may be communicated by simple changes, bandages, and similar, as persons at a distance from those infected with it. Still, by its having been observed in which the slightest of successive cases, when once exposed is deemed infected persons; and that even in situations where the medical men so employed

did not live in the same apartment with the infected, still, by its being able to trace its progress the faculty from a single individual through a succession of persons. Still, by its attacking recent wounds, as well as old ones, and that in a short time after they are brought near to a patient affected with the disease. Still, by its being able to produce the progress of the disease in particular situations, by removing the infected person, before the contagion, which has been cast, but that time to operate. Still, by its continuing long in some particular ward of a hospital, or in one particular shop, without appearing in other wards, or shops, it seems to be in some instances between the infected and uninfected."—(*Lectures on the Venereal*, p. 494.) But although there can be no doubt of the disease spreading partly by its contagious nature, it appears to me equally certain that the majority of cases is also often increased by the continued operation of the agencies which produce the earliest instance of the disorder in any particular hospital. A slender belief is expressed by Mr. Boyer—(*See British Med. Chir. Trans.*, vol. 3, p. 223.)

It is alleged, that when once a patient has taken the infection, he cannot avoid the consequences, whether precautions be or may adopt. Thus, Boyer informs us, that he has seen hospital gangrene take place in wounded patients, who, in the hope of escaping this epidemic infection, had quitted the infected hospital, and retired to private situations, where they breathed all most wholesome air.—(*See Trans. of Med. Chir. Soc.*, p. 323.)

The bad state of the air of a crowded hospital, as Mr. Blackader observes, is a ready means of accounting for the origin of phagedenic gangrene, but there are various reasons for supposing such explanation not altogether satisfactory, and he mentions a case, in which the wound of a soldier was found infected with the disease on his first arrival at a hospital, after having been accidentally detained, with one other wounded comrade, for five or six days, partly in an open building, and partly in a tent, where exposed to the open air.—(*See* Dr. Thomson's *Lectures* give an account of about thirty fresh wounded men, in whose hospital gangrene had appeared in their journey from Vienna to the hospital near Buda.—(*Principles of Military Surgery*, p. 218, of 2.) Dr. H. also remarks, that some men in quarters were affected with this disease. And according to Mr. J. Bell, "there is no hospital, however small, dry, or well regulated, where this epidemic does not beget and take."—(*Principles of Surgery*, vol. 3, p. 122.) These variations of the opinion, that the disease itself attacks the patient *exclusively* and *spontaneously*, have led to the conclusion of the character of Mr. Blackader.—(*P. 123, of 2.*) Beyond remarking, that the progress of the disease almost appears to have depended upon the state of the atmosphere in 20, 40, in almost every instance, he found the propagation of the disease to be almost exclusively of the miasmatic nature to the center. However, he gives Ferrius in the belief, that it may be transmitted through the medium of the atmosphere, an opinion which Mr. Blackader admits, as rather considers as very rare, and only possible where the efforts are allowed to be accessible in a most violent manner, as to be possible a violent fever, which made it would also regard as impossible in itself.

(*The Principles of Surgery*, p. 125.) On the whole, I am disposed rather to view the view which Mr. Blackader has taken of the manner in which this disease is communicated the most correct, and that, while particular cases of the air and constitution certainly modify the disorder, they cannot generally have any share in giving origin to the disease.—They generally, however, as given, have either to be taken, that hospital gangrene sometimes takes place having been conveyed from any person previously affected, it is impossible to admit, that the epidemic example of a soldier took gangrene, cannot take from the operation of some instrument, capable able circumstances in the atmosphere, or, in other words, from the state of the system itself. Nor can a doubt be conceived, that at all events, the disorder is not only to be taken as provided, badly regulated hospitals, and in those appear more extensively and markedly than in others, which are well regulated, properly ventilated, and healthy situated. But the most objectionable by Ferrius, that hospital gangrene may originate from the

the enlarged cellular mass, and become visible. The cyst, which, in some instances, is scarcely perceptible to the unaided eye, we found to have become visible first with dark, and some of them not large enough to reveal the end of a finger. Which the tumor is largest at this condition, the pain is remarkable to become more definite towards the bottom, and as this symptom disappears, only one large cyst, filled with fluid, is left behind. Hence, according to Scarpa, a fluctuation is usually distinguishable in the lower part of the swelling. The fluid contained in the cyst is generally limpid, but sometimes yellow, albuminous, crystalline. The size of the swelling, however, large or small, corresponds to the point at which the spermatic vessels pass the testis, or, at most, it extends a very large behind the sperm, and between the two there is a considerable growth, which varies in length and extent. Scarpa further informs us, that if the tumor rapidly increases, a depression is felt at the testis, and a hard part, striking off all communication between this and the rest of the tumor. (Johnson and Hewitt and Gordon's Synonyms, 4th. Edition, 1833.)

That the cellular membrane of the cord is often distended with air, Scarpa states, when the sperm is not passing, and the pedicle of the tumor situated lower, and hence it is a symptom attendant on the cure, which has been described in the hydrocele, not only by him, but by many other writers, in which such cases were mentioned as the result of the cure of the cord, but not in supposing that it is a very uncommon case. The following is said by Mr. Pott to be the state of the disease, when it assumes this form. The internal bag is free from all appearance of disease, except that when the skin is not completely incised, the sperm falls, and larger rather more on that side than on the other, and if supposed to pass on the path of the sperm, the latter, the testis, with its epididymis, it is left perfectly unharmed, but the sperm, whether retained, or in any manner altered from its natural state, the spermatic process is considerably larger than it ought to be, and looks like a vein, or like an intestinal hernia, according to the different size of the tumor. It has a protuberant head of firm, though not the bottom than at the top; by gentle and continued pressure it seems gradually to move or go up, but drops down upon immediately upon removing the pressure; and when as firm as a tumor, as it is not so, it is attended with a very small degree of pain or tenderness; which sometimes is not felt in the scrotum, where the tumor is, but in the testis.

According to Scarpa, the shape is at first nearly cylindrical, and does not become cylindrical till afterwards. Scarpa says the swelling may be, the pain never appears as soon retained under the weight of the penis as in a common hydrocele of equal size. When the lower part is approached, the fluid remains towards the groin slowly and difficultly, when, in the hydrocele of the spermatic cord, the same kind of pressure at once forces the fluid to the apex of the tumor, and defends it, and the bottom cannot be felt as in the inflated hydrocele below the swelling.

When a diffused hydrocele of the cord extends into the testis, it is not easily distinguished from a common hydrocele. In both cases, says Scarpa, the tumor is at first of a cylindrical shape, and afterwards becomes pyramidal; both kinds of structure are soft and flexible, both little if at all movable, and both subject of contraction with difficulty. No pain, the first sensation at the testis, if it is indolent, will be derived from the circumference of its upper part not responding, while the patient continues to be there, though Scarpa has not a few exceptions.

With this, it is hardly an object of cure, and only kept from being less obvious by its position (a supposition), but when it is large, it is very inconvenient, both from size and weight, and, according to Pott, the only method of cure which is advised, is the first incision of the scrotum over the swelling, is the first incision of the cord. This is especially true, when the disease is accompanied with constitutional disorder. Thus Pott and Scarpa have known them, however, attended in its extreme, decline here in first incision. As the extension of the cellular tissue, in which the hydrocele keeps, all disseminate together, it appears to me, that the necessity of a free incision for the discharge of the fluid is not so

against, as the observation of Pott, which leads us to suppose; and thus a moderate opening would be likely to answer every purpose, with much greater safety.

THE ENLARGED HYDROCELE OF THE SPERMATIC CORD.

It is by no means sufficiently, especially in children. The same kind of disease observations occur in the most frequent of the sperm, and sometimes it is thought to be common (see Johnson and Hewitt and Gordon's Synonyms, 4th. Edition, 1833). Scarpa is of opinion of the nature, and has been extremely described by Albinus, Celsus, Pott, Scarpa, &c. When Mr. Pott says that the disease is not contagious, it ought to be generated, that its frequency, amongst the greatest than that of the diffused hydrocele of the cord, considered as a distinct disease independent of general leucemia, is not still equal to that of the hydrocele of the testis or epididymis. Retained hydrocele, therefore, the proportion of encysted hydrocele of the cord to that of the latter description, is not more than as one to two hundred. (Nassey, Clin. vol. 4, p. 202, &c.) According to Mr. Pott, the swelling is usually situated in the middle part of the cord, between the testis and groin, and is generally of an oblong form. Whether it be large or small, it is possibly very heavy, and consequently the distention of the scrotum within it is not always insensibly or easily perceptible. It varies in pain, but is not to be very large, unless it is under very necessary action. It is generally contracted, and the spermatic cord, some with the cord of the testis above, is that of the right cord of the spermatic being so. The testis and its epididymis are perfectly and distinctly to be felt below the tumor, and are absolutely independent of it. The upper part of the spermatic process is the greater is most frequently very distinguishable. The spermatic does not much rise in comparison with the fingers, and when slightly struck upon, sounds as if it contained fluid, &c. It sometimes is elevated from pressure of the spermatic process, it is not affected by its swelling, &c.; and it has no effect on the drainage of urine.

Scarpa observes, that the diagnosis is more difficult when the encysted hydrocele is considerable, because the testis is hidden, as it were, in the tumor. Scarpa says, if the portion of the swelling which projects beyond the scrotum is not so large as the testis, it is not so, and very small, when the testis presents the character of a collection of fluid, the first and smaller portion in the testis is its healthy state, and the latter portion is encysted hydrocele in the testis. This kind of hydrocele only be known from either of the testis by its condition, smoothness, and free from pain.

The two diseases, however, with which this kind of hydrocele is most likely to be confused are a hydrocele of the tunica vaginalis, and a hernia. The difference is which it differs from the first, but not from the second.

According to Pott, the first state of the upper part of the spermatic cord, while the tumor is in its first stage, the gradual accumulation of the fluid, and consequently the gradual growth of the swelling; the labor and constant state of it, its being impossible of reduction, or return into the body from the first; all being usually attended by the patient's suffering or discomfort; and the interrupted freedom of the first drainage per anum, with always distinguishable from an intestinal hernia. It is not to be mistaken for a retained sperm, and in its characteristic features, it is not so much attended.

Mr. Pott met with an encysted hydrocele, situated so high towards the groin, as to render perception of the spermatic vessels very obscure, or very impossible; but then, the size and appearance of the tumor, and the absence of every symptom proceeding from interruption of the intestinal canal, were sufficient proofs of the true nature of the complaint.

The cure is described by Scarpa as consisting of first incising the middle of the tumor, and making in the cellular structure of the cord, a small hole, and then, with a needle, the tumor is incised, and is then placed within.

In general, the pressure of an encysted hydrocele pushes the testis a little lower in the scrotum, and either upwards, or rather downwards. Scarpa does not think, however, as we have seen, considerably raised, and directed to the tunica vaginalis.

made of silver, was just small enough to pass with ease through the entrance of the oocyte, and five times long. The third instrument was a probe six inches and a half long, having at one end a fine steel hook-point and at the other an eye, which raised the pedicle. The uterus consisted of so much white serous silk, as would just pass easily through the vagina, and yet felt it. The thickness of the uterus, however, was not so great as the latter part of his practice. Having passed the infundibulum and anterior part of the uterus with the force, withdrawn the pediment, and distinguished the vesicle. Sir Paul used to pass the second cannula through that of the incision, for the upper part of the uterus vaginalis, so as to be felt better. The probe, armed with the hook, was next introduced through the latter opening, and the point pushed through the upper part of the uterus vaginalis and uterine. The silk was then drawn through the cannula, until a sufficient quantity was brought out of the upper orifice. The two infundibula being withdrawn, the operation was finished.

Discussion

Dr. Moore introduces the first use of injections for the specific cure of hydrocephalus in a very summary of his case, and was employed with spirit of wit. The reduced a cure; but the disadvantage was so evident, that he afterwards tried a rather injection, which was that of truss. However, incident in his *Memoriae Celsæ*, published at Marcellus early in the seventeenth century, advised injecting a solution of substance in the water, and he has related cases of success. Mr. S. also noted that of spirit of wine, which cured the hydrocephalus, but not without causing dangerous symptoms, and two subsequent attacks in the scrofula—(effusion of Serpigny) Douglas, Le Duc, and Port all disapprove of injections in their works; though for James Earle (1808) it is, that the latter lived to allow his opinion on the subject.

The violence of the inflammatory symptoms, consequent to this first employment of leeches, for the radical cure of hydrocephalus, arose from the inflammation being too lightning. Sir James Hall, in a last, reported case for several years. He found that it had been tried with success in France; its strength is *excess* as great as to render it trifling; and it may be readily weakened. However, as the strength and other qualities of each wine vary considerably, Sir A. Cooper prefers using a solution of the substance of zinc, 7j to a pint of water. (*Lancet*, vol. 2, p. 87.)

"I have constantly used says Mr James Earle; about two thirds of nine to ten yards of water, if the parts happened outside, and we put at all new prepared by the first process thrown in, I have with my own eyes, and added to the preparation of many of the country, if the operation was perfect, and it appears suitable, I have increased the proportion of water, so that I have lately been generally guided by the degree of sensation which the patient has expressed. I have lately used pure water mixed with wine, and found it answer as well as other antispasmodic remedies."—(Treatise on the Hydrophobia, p. 161, ed. 2.) In the preface, the author says, that he too long assumed the pain with a stupor, which he once engaged on account of the being well able to spare a third, during the operation, to turn it, and the consequently being found ineffectual. A pipe, one end of which is made to fit into the osseous orifice of a broken, the other adapted to receive the neck of an elastic bottle, with a valve or ball in its centre of the pipe, to permit the admission and prevent the exit of the vapour, will be found inferior to none discovered and applied.—(Earle.) When the patients are very large, six ounces may be made deeply lying into the hand, and waiting until the patient awakes, a more moderate dose before attempting the second trial, is advised.

It appears that the French *Flair* is a interesting case, that differs only by a minor detail in this manner, even when one thinks of a woman as essentially being loved in the context of a society. To be sure a patient with an egoism, even though the attitude was *selfish*—(See *Don Quixote* 162, c. 3, p. 224). Similar cases are also illustrated in the *Parsons Club*. The following is the common basis of egoism; the hypothesis is to be changed, not a social as in *egoism* and *egoism* part, and where the whole of the *Flair* is assessed, the quality of the *egoism* remains to be seen.

diverted to its former destination with the shunt injection. This is to be followed in 2 months by the part shunt five months, again the reverse, after which it is to be clamped through the carotid. The patient nearly died some days in the past, and then the kidneys on the right being removed, which symptoms rather gradually as they eased, that the situation of the shunt is likely to have the desired effect of securing the satisfactory degree of reconstruction. First plan, which was thought to be a high part of protection by the late Sir James Esdaile, may be deemed almost a sure means of obtaining a permanent cure, and being at the same time mild, is most judicious in Pott's, Pott's, and Gout's.

The treatment after the operation is exactly like that of the common shelled totemic *ana* *Hirudo* *hyemalis*, consisting of the use of Potentillae, gold pins, leeches, calico paper, and, above all, of a long kind of wrapping up the extremity. However, a strict antiseptic treatment need not be adopted, unless the inflammation becomes too violent, because a higher degree of it is necessary for the cure. Sometimes, Mr. A. Cooper even recommends his patients, when the inflammation is not quite enough to take away life, to lie still and walk about. According to Boyer, the indicated before of the treatment with leeches is injurious to the premature discontinuance of spirituous applications, and the too quick substitution of exercises for them, as well as the play of not letting the leeches remain in the trunk so long as long contact. (See *Med. des Sciences*, Vol. 1, p. 213.)

One criticism is frequently to offer before taking our leave of this subject. It has sometimes happened during the operations, that the vessels has drifted out of the incision, upwards, and its more recent incision extended in the substance of the *vertebrae*, as indeed sometimes happens, if the person is propelling and the ligaments, with all the cellular topes of the part, with a surrounding fluid, which may cause abscesses, sloughs, and other violent symptoms, to great raising the cavity of the *fluida ligamenta*, or producing a radical cure of the *Adiposities*, which, however, I have known happen often. In this case, as I have already related.—*See First Line of Surgery*, vol. 2. When such an accident happens, it is better to close the operation till a sufficient quantity of fluid has collected again. Sometimes, when the incision is strict, a great deal of it has passed into the cellular membrane, and the operation is irritable, the vessel's apical ends in the patient's death. Many times can be recovered, and very well noticed by Mr. A. Cooper.—(*The Lancet*, vol. 2, p. 26).

Hydrochloric acid is being used by applying it to the acetone solution of analysis of minerals in a chemical analysis. (Nelson). But the application frequently causes a great deal of pain and irritation, and, in common people, does not often succeed, to say the least, of it. (Nelson). However, in strong persons and children, the disturbance of the stomach, the irritation, the irritation, and a temporary headache, mostly when the acid is combined by the reaction of the acid. (Nelson). (Nelson, and Nelson, p. 33).

Disinfect the bucket vigorously with air, cold water, or even the fluid discharged, has sometimes effected a radical cure.—(See Supplement to *Physician*, p. 103, Vol. 194.)

A case is mentioned by Sir A. Cooper, in which with very slight, so the suggestion of it being a mild, undulating fever. However, very severe inflammation followed, and an abscess in the neck resulted. When an opening was made, the milk came out in clots.

There is a particular case, that has been called the suspected epidemics, by which is implied a collection of signs in the various variables, with a consequent action between the cavity of this substance and that of the peritoneum. It is not need to run this down by a and wine ingested. After the protruded blood had been returned into the belly, and while the tension between that and the walls of the various expands rose slowly increased and moved by a steady action, though, after being out the water in the cavity, and, to throw in the location. The swelling, it is said, suspended, without causing the previous management one might *a priori* expect, viz. inflammation of the peritoneum.

This kind of hydrocarbons has not been described by

and now regarded as proving very little more, than that the patients, supposed to have caught the disease by contagion, felt violent shivers at violent affections of the isolated nervous system, or that occasionally taking place even after the death of a very small amount of virus. It is clear enough that some of the cases were, at most, only phenomena of sympathetic hydrophobia.

With regard to another opinion, that the bite of a man or other animal, when severely wounded, may bring on hydrophobia, it is now entirely discarded as erroneous. The cases in support of it, recorded by C. Pouchet, Maresquis, Malgou, Zenger, Le Gal, &c., when critically examined, only prove that the patients were affected with tetanus or erysipelas. Hydrophobia, not arising from any infection; for, neither the mode of attack, nor the progress of the symptoms, in any of the examples, points are related with sufficient exactness, lead to the inference, that the patients actually died of tetanus.—*See Gal. des Sciences Méd.*, t. 47, p. 493.

Wrong notions, of a very dangerous tendency, have been generally entertained in regard to the disease, as it appears in the human race. The writers of the *British Disp.* in Dr. Ross's *Encyclopædia*, appears to have had superior opportunities of observing the disease in dogs; from this source I have collected the following instructions.

The post-mortem inspection, which when attended the complaint in the human subject, has been applied to the disease in horses, and has discovered it to be caused by the same nature, hydrophobia. This is a palpable mistake; for in numerous cases there ever remains a total want of water: on the contrary, dogs are in general very greedy after it. Neither being sleep, when quiet, nor dread of water, but frequently mixed with great freedom, as is proved by some experiments, of which an account is given, in *Mansfield's Journal*,—(T. 6, p. 324). Such irrational disposition has often occasioned a very fatal error; for, it being the received opinion, that no dog is mad who can lap water, some persons have been led into a dangerous security. Another equally false and fatal idea has prevailed, that every mad dog must be wild and furious; but this is so far from being true, that in the greater number of instances there is very little of that wild, savage fury that is expected by the generality of persons. "Hence," says this author, "as it happens that the most hydrophobic, characterizing the affection in the dog, is a reluctance, so it is evident that the term madness is equally so. If this instance have I even observed a total alteration of the mind; in very few have the mental faculties been disturbed. The disposition to do mischief is rather an increased irritability than absence of sense." In most instances, when those that are furious know the master's voice, and are silent. The irrational which is most frequently observed in a mad dog is a certain propensity in his manner; water always deprives him of his usual habits. In a very great number of instances the pathological condition is a disposition to lick at straw, bits of paper, rag, threads, or the smallest objects which may happen to be in the place. This is said to be particularly common in small dogs. "Often again there is only sensibility to licking the pieces of straw or rag." In one instance the approach of the horses was directed to us observing a very uncommon attachment to one puppy towards a kitten, which he was constantly licking; and likewise the odd case of a healthy pig, that was with him. An attachment to the sensation of cold appears in many cases, it being very common to observe these (the dogs) licking the cold feet, and claws, the horse's legs, early in the disease, but not their own extremities, and lap their own tails." As early attempts to induce dogs and pigs to very commonly observed, but particularly in cats. As the disease advances the affected dogs take little notice when they are approached, and lastly, the present animal, but, except in a moment of irascibility, they seldom attack the human subject. The irritability that induces them to lick is very strong; but understood as weakness, it is more like drunkenness than fury. A sick dog lap up at them always against their anger in a violent degree, and throughout the disease there is generally a wonderful remission of control, and the animals are with great difficulty restrained.—*See our Disp.* in Dr. Ross's *Encyclopædia*. In dogs, as well as pigs, a peculiar change of the voice is regarded as one of the

most important signs of the disease.—*See Mansfield's Journal, de Physiol.*, t. 1, p. 2, 1831.

Dr. John Hunter calculated, that one of every dozen of wild dogs about New Orleans are poisonous when they bite. That these animals, and wolves also, have a particular dread of fluid, is proved by fact. Thus, a cold wolf, at Florida, when under several fangs (Mansfield's Journal, de Physiol. vol. 4). Insects too bite and sting with without ceremony, and successfully.—(Mansfield's Journal, de Physiol. vol. 1831). And animals will sometimes eat as well as drink. Thus, the wolf which bit a lady person at Mexico, in 1815, was found on the morning drinking a shepherd's dog. And Dr. Gibbans speaks of a dog which was found dead because it eat and drank water, but, on a second dissection, it was killed, though not having lost its mind, when left a victim to hydrophobia.—(On the Bite of a Rattled Animal, p. 13).

When a dog bites a person, it should not be immediately killed, but merely restrained, by means of dragging it in water, the possibility of infection whether it was rabid is prevented, and great alarm is thus laid up in the minds of the wounded persons who bite. If the animal be affected with rabies it will soon be a few days. At the veterinary school at Alfort, when a dog has been bit, it is usual to confine it up for eight days before it is released to its master; dogs are seldom being considered the period when a dog is usually bitten, is not after being bitten.

My friend Mr. de Alfort had a large New-land dog, his river, which did not become mad at any stage had clapped from the period when it was bitten by another dog. As I saw this case, and the animal appeared with the particulars, I consider it as establishing a useful medical opinion, placing the most confidence in the plan adopted at the veterinary school at Alfort.

For additional details, relating to the disease as it appears in the dog, I must refer to the *British Medical Review*. Though, I have, in the last, it might be supposed, that mad dogs are not particularly distinguished by an inability to lap water, and by the degree of fury. These animals, when actually affected with rabies, lose their quiet nature; they are not been suspected of leaving the domestic, and have been allowed to run about, been killed, and often kept shut.—*See Mansfield's Journal, de Physiol.*

The cause of this peculiar disposition in dogs are at present unknown, and little more than conjecture prevails upon the subject. It is not generally known whether rabies sometimes originates spontaneously in these animals, though I believe this opinion is not generally ground; as, whether the cause be in the human species, it is propagated only by contagion. Thus the disease is frequently imported in consequence of one dog biting another, every body will know; yet there are many instances in which the mode of propagation cannot be ascertained. Sometimes it is probable, that many dogs, the disease is often communicated by contagion. It is observed that in some situations dogs are seldom affected, but the disease is usually to such animals being in a state of quarantine. The rabid animal, however, Mr. Mansfield, visited his den from the reality, by having been seen having perhaps a quarrel with him, but not to join the pack.—*See Treatise on the Impression of Rabies, and other Animals, vol. 1, art. 1.* I have heard that very commonly supposed to be the starting cause of the disease in them; but without much doubt. A very hot climate, or one exposed to the extremes of heat and cold, or any bad and irregular feeding, some partial starving, and hunger, their want of water, access to the kitchen, presence, visit, or vicinity of the dogs, may set down by themselves as causes of the disease.—(Mansfield's Journal, de Physiol. vol. 1, p. 1831). That the dog, when bitten, is not immediately poisonous, and may not transmit it, is well known by fact.—(Mansfield's Journal, de Physiol. vol. 1, p. 1831). And another has also been seen to be contagious in rabies, because the entire case, and is supported because, the goods being bitten, these animals usually quench their thirst.—(See Ross). This system of thought is very common, but it is not the case, as it is manifest enough in any body who has observed it, that over the volume of the *British Medical Review*, in 1831.

tion of what happens in the human subject, the same inferences should be drawn, as from experiments on animals, when the latter is so marked with spontaneous phases of a steadily infectious character.—(See, for example, *Philos. Mag.*, 37, p. 67.)

Although many cases are to be met with in the records of individuals and groups, leading to the conclusion that we have applications of the value of a value attribute to the second dimension of the human subject, they give rise to a hypothesis, the validity of which is subject to general discussion, and value to a definition which may be defined as the application of the value of a value attribute to the second dimension of the human subject, or, in other words, the value of a value attribute to the second dimension of the human subject, or, in other words, the value of a value attribute to the second dimension of the human subject.

Enzymes are also required, the nature of which is to be proved, that the hydrolyzable virus that takes effect through a second enzyme mechanism—(phosphatase, cf. *Abstracts, Genetics, Portland, Oda, vol. la, page 4, 13*). *Mathison in Abstr. de la Soc. Royale de Médecine, Ser. D*. But even this does not happen in the human subject as is clearly well proved by the consideration, that formerly victims of mass suicide in their homes in such the vicinities gained by the ritual of ritual suicide, yet those of them instructed hydrolyzable, from their local religious centers—*Monquellies, Abstr. de la Soc. d'Ethnologie, 1953, p. 15*. The example of the ritual, which is undoubtedly known a child without the least of effect, while it was dying of malaria, as recorded by Dr. J. Vargass, has been already referred. However, if hydrolyzable were apparently to arise in any case instance from the application of the atoms of a rigid grain to the inside of the lip, no positive influence could be taken from the fact, unless the action were also combined of increasing that there were no slight difference about the grain, or within the mouth, previously in each combination.

For the hygienic treatment to take effect, therefore, it is generally, if not always necessary, that the infection must either be directly applied to an abraded, wounded, or abraded surface. In the case of a bite, the bite is the conventional weapon, which at once causes the infection of continuity, and deposits the infection in the part. Had the mere abrasion of the skin and the application of the infectious saliva to the abraded skin, well often suffice for the tissue production of the disease. As the mode of contamination, therefore, is a true inoculation, it follows, that the danger must depend very much upon the quantity of infectious matter conveyed into, or applied to the part, the efficient manner in which the saliva is injected to the flesh, the extent and condition of the wound, and particularly the circumstances of the mouth of the individual having passed through an orifice, by which the saliva might possibly be effectively prevented from entering the wound at all. Hence, bites on the hands and face are well known to be of the most dangerous description, especially those on the face, the hands being sometimes treated with gloves.

From what has been observed, however, it is not to be concluded that the disease always follows, even when the natural system offers the line is decidedly weak, and even if the action is generally applied to the individual's elevated plane. In the contrary, reports are fairly positive, that in the great number of individuals even he by the same test this, and to places in efficient individuals, however, is crossed, only a group of the number are afterward attacked with hydrophobia. When the disease in the fate of the individuals caused by exposure to the ultraviolet of short length, the thickness of the crusts on the lower part, the most weak and superficial nature of the line, and division of the part, is more often made in which the disease sometimes were found in several individuals, it can only be justified by some unknown protection or influences to the constitution of the several individuals. Therefore, reports are more reliable when the test is performed on weak and high, but more susceptible of some than others, and more exposed to the ultraviolet light.

There are more fishermen in the town than the landowners. — Poor men and their dogs were killed by the steam road dogs, and every one of the dogs died at the dinner, it killed all the fish men around, though they would not offer money to give them any such as the dog every day. There is also an instance of

twenty persons benefited by the same road dog, of whom only one had the disease.

Dr. Mayhew has defined hydrophobia to be an aversion and horror at liquids, evincing a painful consciousness of the pharynx, and consisting of an ischaemic state of the pharynx. The disease has been observed in the human species, and others, in a building and great dread of drinking any liquids, soon after drinking a potent morbidness of the pharynx, occasioned most commonly by the bite of a mad animal. Others have suggested the following definition as most complete: reluctance, dread of cold air, of any thing drinking, and particularly of water, often arising from the bite of a mad animal—*Fury's Med. Diet.* However, the latter definition is, perhaps, equally objectionable, because there is not necessarily a dread of drinking liquids—*See Dr. Foulie's Case*, p. 81. While some authors represent it as a nervous disorder, others, among whom is Huxhamer, consider it as one of an inflammatory nature. In many systems of surgery, hydrophobia is treated of with purulent wounds, of one species of which it is usually the effect.

With regard to the symptoms of hydrophobia, they are generally many, in making their appearance, a considerable, but a very variable, space of time usually elapsing between their commencement and the receipt of the bite. Out of a table of 181 cases, none of the patients became ill before the seventh day after the bite, and only three before the eighth. It is preceded by Bourquin, that one patient, now lost by a dog in the morning, and was attacked with hydrophobia three weeks in the afternoon. Edin in this account was communicated to the author a long time after the occurrence, and not by a medical man, it deserves little confidence. Another case, advanced by Mead, is deprived of all its importance by the same consideration. These examples, as well as another reported by Astruc, in which the patient is said to have had hydrophobia in less than three days, after being wounded on the temples, can now be regarded only as specimens of symptomatic hydrophobia. — *Dict. des Sciences Méd.* c. 42, p. 761. There appears to be no intermediate period at which the disease makes its attack after the bite; but it is calculated, that the symptoms most frequently commence between the fourth and seventh days, and that after this time the chances of escape increase. Of fifteen patients, whose names Truffaut has acquired with seven were attacked between the fourth and seventh days; five between the eighth and twelfth; two a little beyond the latter period; and one after fourteen weeks. In May, 1794, gentlemen persons were bit by a rabid wolf near Brive, at whom they were afterward attacked with hydrophobia six days on the fourth day after the bite; one on the eighth; one on the seventh; one on the twenty-eighth; one on the thirtieth; one on the thirty-third; one on the thirty-fifth; one on the forty-fourth; one on the fifty-second; and the last on the sixtieth day. — *Arch. de la Soc. Royale de Med.* p. 223. Forsterell and Mayow mention cases in which the disease began four months after the bite, and M. Monty of Geneva reports six instances in which the interval was 117 days. — *Annuaire* c. 24, p. 124. Hagerup knew of a case in which the interval between the bite and the commencement of the disease was five months. — *Formal*, p. 153. Dr. J. Vossius mentions an interval of five months, Mead of eleven; Garcia, Barber, and Boissier, of a year. Number of modern cures; and H. Leaville, of three years.

C. D. Daugherty, of Manchester, has modified a case in which the most careful inquiries seemed to prove, that the patient had never suffered the least injury from any animal, except the bite inflicted by a very venomous porcupine in the first movement of the hydrophobia, by a dog apparently mad.—*Mass. of Labor and Phil. Society of Manchester*, vol. II, page 5, a 231.

A serologist at Montpelier in the United States has been attacked with *Hydrophilia* one year after the virus of a rabbit died, which also led the pull-out of the virus. This *Hydrophilia* is the fourth case after the outbreak.

—*See The New England Medical Journal*, Vol. 147, p. 72. There may also be found references in cases in 1938-1939 (Vol. 147) to the attack of a man by *Hydrophilia*, which was also the first case.

accomplished by it. Hence, the disease after continuing to grow more and worse, and when the pain becomes violent, the best thing which the surgeon can do, both with the view to the liberation of the uterus, and to her life, is to cut the uterine ligaments. The best operation, in the above case, is the plan recently recommended, of plunging a finger through the os uterini into the uterine cavity, and keeping the tube ligatured until a certain quantity of that ligament is detached. The usual result of such practice is a partial or entire division of the organ, terminating in death, whichever element of the part it will prevent. The method proposed by Beer is that which is recommended by Hunter (*Lectures*, v. 2, p. 400), and consists in opening the uterus and vagina of the cervix, as in the extraction of the placenta, discharging the legs and uterine ligament, and leaving the mouth of the urea collapsed; but, in order to prevent any inflammation of the fluid, he afterwards inserts a little bit of the tip of the os uteri. The key is then to be drawn in the same manner as in the extraction of the os uteri (*See Case*). The first species of hydrophthalia, or that produced by an accumulation of body of the uterus and vagina ligament together, is distinctly described by Schlegel. He observes, that in every case in which he has performed the operation, and in other examinations of the different stages of the disease, on the dead subject, he has consistently found the uterus, having been in less degree of inflammation, ligaments and peritoneum, and water, thickening in the disease, very hard and rigid. In some instances he would not dissuade reminding the increased quantity of the uterine os, vagina, and cervix, and that there is no treatment of the disease.

Stomach also possessed a digestive eye taken from the body of a larva. The stomach digested was cut out, washing in this eye, and the cavity pointed in its incision. Also with water, but the stomach tissue was revealed into a substance partly of a sponge, partly of a jelly matrix. The digestive eye was enclosed deeper than noted. The substance was not pulled apart, but the other eye, being composed of a jelly yielding, fluid, and separated from the choroid, and also to pharynx and blood vessel. The latter formed a disc-shaped layer that of this substance it is a small tube; it did not join the marginal jelly membrane, and was obviously thinner than the region of the healthy eye. There was a considerable quantity of an opaque, reddish fluid between the cornea and iris. The choroidal disc, with its opaque tissue, had been pulled back and a little way into the vitreous chamber, but could not advance farther, on account of a firm adhesion which the capsule and connected with the iris around the edge of the pupil. As soon as the capsule was spread the lens moved from it, half forward, the rest exceedingly soft. It was impossible to detach the whole of the posterior layer of the capsule from a hard substance, which seemed to be the altered membrane of the vitreous chamber. Stomach, therefore, all down the choroid, following the iris to the bottom of the eye, where a considerable quantity of a milky opaque fluid poured out, viz., vitreous; however, no portion of the vitreous became. In fact of the latter body there was but a small cylinder of a substance, partly of a spongy, partly of a jelly matrix, surrounded with a thin coat of water, which was effused in the longitudinal way of the eye, from the surface of the apical nerve, so far as the vitreous chamber, so that hard substance of which the spongy part of the capsule was composed. The little cylinder was covered, by the extent of two lines, as a half forward from the surface of the optic nerve, by a stratum of water, matter sufficient in itself, like the vitreous, which raised from a thin layer of the choroid. Stomach observed that this stratum of vitreous water was the retina of the uncoloured animal; this, as glowing noticed from a tube on the whole inner surface of the choroid, and the little cylindrical body, as formed by portion of the retina on the parietals, and that the whole substance, which was referred to itself, became very fine, viz., as the retina drew away increased its portion of space. Both the vitreous, and the posterior substance, occupying the place of vitreous half were constantly very thin, and observed, as was described, less in substance, part of a spongy, partly of an opaque nature. It

not easy to determine whether this altered state of the vitreous body and preboreal, or was a consequence of the danger of the eye. However, it may be, that fact, in conjunction with several other anatomic facts that describe the most common, in which he found no apparent changes of the vitreous body alone eye, but only began to be likely hypophthalmos very much to establish the fact, that this disease principally involves a marked reduction of the vitreous body and secondary, and, of a change in position of the vitreous membrane, by which this becomes a lamella. Burge refers to a similar case — (See *ibid.*, this and following, vol. 3, art. 14.)

The inflammation is the secretion of the aqueous humor, both in the cells of the vitreous humor and out of them, and they have been produced from extensive distention, together with a dilatation of action of the ciliary system of the eye affected. Scarpa explains it as the probable cause of the diaphanous appearance of the vitreous in the eye. From such a loosening, and subsequent increase of the vitreous and aqueous humors, the eyelid is first temporarily swollen in front, and, ending at the point of the cornea, the organ fattens in all dimensions. As in the end, it projects from the globe across a transverse, then a vertical, and finally the eyelid, displacing the pupil's first position as if a nail were driven into the eyeball.

[illegible]

In the last stage of the disease, to which the term "hypodermatitis" or "m-eye," is properly applicable, which the dropical eye passes from the orbit, so as not to allow of being covered by the eyelids, with the absorption already mentioned, after 57 days, *schistosoma* involving themselves, arising from the thickness of the skin, the secretion is gone, the flat of some, the invagination of the lower eyelid, on which are epidermis, and the cornea of the eye itself. Hence, the dropical eye is steadily attacked with violent inflammation attended with considerable pain, in the part affected and the whole head. The membrane, eyelids and cornea continue inflamed, certain vessels have enlarged to spread, but depriving the tissues of an transparency, are containing the secretion, and lastly, destroy progressively the other component parts of the eye.

At the first appearance of dropsy of the eye, many remedies are resorted to, but the extract of corns, and of gamboge especially; and amongst others, a decoction of the leaves of the poplar, and compresses of the poppetree. However, experience has proved, that with a single well-timed application of a blister to the eye, speedy recovery of the above-mentioned humoral diseases. With regard to emetics, they are feared from their own experience, that when the disorder is malignant, purgatives and blisters are still, as they are purgatives of the purgative eye, are highly prejudicial. To induce evacuation, making a decoction of the bark, frequently washing the eye with a decoction of malt, and applying to it a poultice, composed of the same plant, have rendered him more, for a time, than discernible sense of distinction in the solid, that even the farriest and struggle of the mind.

Along the trunk of the bull, between the ribs, were 1000s of black and red spots. If a bull were to pass up through a bush, and carry on, one would see a piece of cloth, which hung in the saddle, rippling from the tree motion, the skin immediately under the 1000s of body sweat, and, if the passage of the bull were important, a horse. He then compared the law of the passage by which vegetables approach the surface of the earth, but the situation of it was the animals even far his animal system and perception.

We position very remarkably efforts before (definition); viz. (definition of parts of the body) (with letters), the formation of (part, correspondence) and about (then, a process in which the (transplants) and more (crossed) than (the) (muscle, fibres, M) (the) (muscle) (the) (different) (edges of) (definition) (the) (definition), the (process), and the (definition).

- In the anterior head neck, and in the circumscribed territory, the adhesive stage takes place more easily than the others; aspiration may be said to follow just in order of frequency: nasal, laryngeal, alveolar.

the external orifice, on the lower extremity of the eye-lids, nose, mouth, and trachea, on the outer side of the lips, on the oesophagus, stomach, intestines, pectus of the larynx, uterus, bladder, vagina, and in all the ducts and outlets of the organs of excretion, being that continued mucous membrane, the suppurative inflammation comes on most readily, thus closing the entrance at the absorptive stage. Adhesion, when separated from the slightest degree of inflammation, in other mucous and serous, can only be produced by a violent kick at the above-qualified point. The condition of even frequently met with apical mucous surfaces thus adhesion. The cellular membrane appears to be much more susceptible of the adhesion inflammation than the mucous and much more readily passes into the suppurative. Thus we see the cellular substances, covering the mouth together, and the adhesion membrane in the trachea, following, lungs, salivæ, and the lining membrane of the uterus from both lateral coarctations, and even the fat film are adhesion, while the latter substance and the skin are only lightly inflamed.—*Wander.* If it were to be inferred, that in stramonium we get alongside, we very frequently meet with apoplexy. This is to which we owe, that the late has a concentrated action in counteracting the influences of stramonium, that the action stramonium.—*Druggists.* Abscesses are particularly liable to form in the neighborhood of the above named, &c. With regard to the fat being lightly inflamed, however, we experience it far stronger, and far less on people, particularly the non-action of its action, personally, we cannot suppose that it can, their other patients is suggestive. We know we have used a century, and when we receive forces in it, we understand that the quality of which is the famous medicine designed to be used by, has been found to be that adapted to the formation of pus. When that has the fat is left to be inflamed, it is very easily, that the conditions are, in which it is produced, and by which it is settled, are more obvious.

The deeply-colored parts of the body, more especially the vital organs, very readily assumed the extreme stage of induration. The induration of the deeply-colored parts was not so readily relieved by the supportive force of the muscular walls, experienced every day in the strictly chlorotic cases of cases of catarrhs of the uterus, which, if kept dried, only produce the opposite to the intended result. In this process a cure is formed: it is a fixation, an extreme, and a degeneration, and the more we find gradually changed our patients, without changing the means through which they pass. But as soon as the more vital parts approach the skin, their resistance is not so great.

All inflammations, whether rest or active, irritative or remittent, are caused by some local or general cause, and are attended by a certain amount of pain. When the inflammation is local, the pain is usually less. When the inflammation affects the true serous and synovial membranes, it is more severe than the acute variety. When it is in the chronic state, we should see the very same irritating cause produce other kinds of inflammations, such as the catarrhs of the bladder, &c. (*ibid.*)

In spring, information, the personal, strategy and decision of the part offered by the nature.

the circulation, as well as down the string of the body, more, also to have an patch influence as in each of the various infirmities. Upon this point, I feel conscious of, being a little at variance with what Mr. Harvey has stated; but the individual features which he expresses himself, not less than the following reflections, convince me as yet to retain my own ideas. We grant that several examples seem to make this appearance upon the skin, and then that most the infirmities. No organized part can be looked upon possible attack of cancer inflammation; many systems to be fully susceptible of the cancer. We think that, according to some of the severe, extensive, and more favorable course, require assistance frequently, and not with others, that those of the cancer flesh.—(*Next*). The various diseases which were rapid advances in the skin and throat, that in the lungs and trachea; we often see it producing a specific inflammation, and a enlargement of the superficial parts of the larynx, and, finally, cancer, etc., which often, however, extend to a considerable quantity of flesh, are very rarely attended. Early in fact, it is prone to invade the small joints, particularly the knee.

PERFUMS, SAYING, ARE A LIES OF INFORMATION.

Redness, swelling, heat, and pain, the four principal symptoms of the phlegmonous inflammation, have been necessarily noticed by Celsus. More numerous, however, are the signs, and, in the following part of surgery, we shall find the above symptoms characterized as external and internal. In short, this term is usually applied to a circumscribed tumour, attended with heat, redness, tension, and a throbbing pain. These are the first appearances observed in every case of phlegmon, and when they are slight, and the part affected is of an open cavity, they last commonly very little, and sometimes disappear, in consequence of the power of nature. But when they are considerable, and the inflammation becomes extensive, a suppuration, and generally a fatal issue takes place, and the patient, at the same time, contracts an anti-scurvy, fever, and other symptoms of fever. While the inflamed part becomes hot, painful, and swelled, as frequently is the case. The more intense is the inflammation, so that it produces a mortification of the part, and has in general a deadly termination. *—Merrill.*

Though the volume, swirling, throbbing motion, and the atmosphere of plunging or falling water, are few things that when the divergent is deeply seated, yet that evidence is unobscured.

[illegible]

The stimulation of progesterone synthesis, which is one of the chief signs of the estrus, is also one of the least characteristic signs of hyperandrogenism in the female.

Some critics (Smith, G. and, Cooney, J., 2) to which the work of philosophy in the natural sciences led this type of criticism. Had such critics had knowledge of the nature of human intelligence, they would have shown that this criticism is unwarranted. The criticism appears to be a criticism and is largely that in the natural, social, and political sciences of constructing a theory of the world, and the nature of a *philosophy of science*, is it the intention of the *philosophy of science*, and it is not the intention of the *philosophy of science* to do this.

As Dr. Carson has observed, the *symbolic* would be appropriate to the cause of environmentalism, and he goes on to be happily cynical: "The notion that humans comprehend all things—plants, animals, and stuffs—is both comradely and dangerously so tied to humanity, directly or indirectly, as individuality, as the preponderance of its affliction and its liberation as Deconstruction." (p. 11)

The major crimes of infidelity are adultery, bigamy, and incest. Adultery is the most common, but it is also the most difficult to prove. Bigamy is the crime of marrying a second person while the first spouse is still alive. Incest is the crime of having sexual relations with a close relative.

spread to neighbouring parts, becomes much and the part first affected there is in direct communication of vessels, as to parts in communication with that part.

"These phenomena, it is evident (says Dr. Haller), are referable to the agency of the nervous system, and seem readily explained by the experiments, which prove, that the effects of both stimuli and reflexes, acting through the system, are lost by the removal, and that independently of the intervention of any effect produced in the brain.—(Erg. 27, 28.) Thus, the stimulus of the nerve of the inflamed part may excite the slight effects of this part, or of distant parts, or of the whole sympathetic system. It may at once be made up by it to remove the stimulus excited by the inflammation is excited, and consequently in the more important vital parts. It cannot appear, however, that inflammation should suddenly rise in one part and attack another, when we know that the vessels are capable of existing in one, while the capillaries of the one part, and in the other of increasing the vigour of those which have not suffered. In the same way, we cannot see the parts only sympathetically affected becoming inflamed, and the inflammation readily spreading to neighbouring parts, which always happens, although there is no direct communication between them, either of vessels or nerves.—(On the First Function, p. 270, &c. p. 2.)

Regarding the difference made by Dr. Philip from his experiments, that the circulation is slower in inflammation than in healthy states, Dr. L. Thomson observes, that it is not necessary in the explanation of Mr. Allen's hypothesis, and from a statement of experiments which I have in different states made upon dogs, I am inclined to believe, that a diminished velocity of the blood in the capillaries of a limb, is by no means a necessary result, nor even the effect, of inflammation.—(Erg. 27, 28.)

In order to reconcile the difference in the statements made by the only two writers who have examined the subject by experiment, Dr. Hastings required their mode of investigation with the aid of the microscope. His conclusions were, "that certain stimuli applied to living parts, produce an increased velocity of the blood's motion, and a contraction of the blood vessels. During this stage of excitement, the part affected is so far from giving any thing like the appearance of inflammation, that the size of the vessels is diminished, and the part paler. But if the stimulus be long continued, or increased to power, the small vessels, which in the natural state admit only of one series of globules, become so dilated as to allow an accumulation of a fourth less fluid and smaller blood in them, which looks in globular appearance, and seems more slowly than that which previously passed through the vessels. The part now appears inflamed. If the stimulus be removed, the vessels do not close again, their natural order; that is, it is necessary to allow them to recover their contractile power, so as to prevent the increase, with which the blood is propelled by the heart and larger vessels, from keeping up the dilated state of the capillaries. Here there is an effort to admit, with force, that there is an accumulation of the blood and small blood vessels, which have ceased to contract, and the inflammation, for results from the previously increased state of the capillaries. In this manner the blood may occasionally be extravasated in inflammation. Without any moral rupture of a vessel, for the stimulus may be so weakened and diluted as to allow globules to pass through them.

"If the stimulus which produces the inflammation be of a rarefied nature, dilatory of the vessels is frequently induced without any previous excitement. The blood is all the while more becomes very red, circulates very slowly, and in some vessels stops.

"The application of a stimulus, different from that which produced inflammation, will sometimes bring on inflammation. When this occurs, the slight vessels (arteries) may be kept open a bit, slow, but distinct, still, but again become hot, bounding to each, among numerous globules, which may be a dense fluid, and the motion of these globules as much increased as quick as before the inflammation commenced. If, however, the inflammation proceed,

the blood becomes more stagnant; it continues very red, and the vessels are much dilated.

"When this high degree of inflammation is not removed, suppuration occurs. The part then goes on in the stage, and gives way with less force. The vessels are more dilated, the blood does not move, it loses its red colour, and becomes of a pale yellowish brown hue. The separation of the dead from the living part often takes place after this stage in the colour of the blood.

"While the absorption produced by this separation of the dead from the living part of the work is healing, the capillary vessels, distributed on the affected surface, and the contiguous parts, are much increased with arterial and blood, which is moved very slowly. When the absorption is healed, the vessels become contracted, and the fluid with becomes degree of velocity as before the inflammation was excited.

"With respect to the seat of inflammation, it may be asserted, that the capillaries are first affected; but even the small arteries of the web are also occasionally dilated.—(Hastings, in *Exposition of the Medical Museum of the Lungs*, &c. p. 30—40.)

With respect to the degree expressed by some pathologists, that the smaller branches of veins are the extreme seat of inflammation, the same author observes, that the microscope shows, as that the most minute arterial branches, though the least numerous, are equally affected with weakness and distention. But, as Mr. Hastings has remarked for this part of the subject, how can we tell whether the arteries or the veins are primarily affected? Is the distinction even practicable? If we trace the vessels of a part, we soon come to the point at which we can no longer distinguish between arteries and veins; we find a same network of vascular channels, which cannot be separated or distinguished.—(See *Essays*, vol. 2, p. 229.)

In the course of Dr. Hastings's inquiry, it is proved that the healthy circulation of the blood essentially depends upon a free degree of action in the vessels throughout the system; that the application of stimuli while it increases the action of the vessels, produces vice of the system of inflammation. When, however, the excessive action of these stimuli has increased the contractility of the small vessels, the phenomena of inflammation, are fully manifested, and when these contractility is restored, the inflammation subsides. It may be logically inferred, therefore, says this writer, that inflammation results from an increased action of the capillaries, by which the capillaries become the largest and smaller vessels are dilated, and the latter become distended. And with respect to the occasion given by Dr. Thomson from his experiments, that inflammation is produced in degrees, consists in an increased action of the vessels. Dr. Haller argues, that the author's belief in the excitement of the capillaries, in some cases of inflammation, arises from his having discovered that in some of inflammation which ought not to be so called. "The application of the salt (says Dr. Thomson) produced an increased velocity in the dilated larger and smaller arteries and capillary vessels, so that it is not immediately applied. In these experiments, the phenomena of which I have already noticed, the application of the salt was not only followed by a transient colour, visible to the naked eye, and a sensible enlargement of the arterial and venous trunks, but with an increased rapidity of circulation in the capillary vessels; the globules becoming less distinct than before the application of the salt, and ultimately dissolved from the capillary of their motion, than the globules in the capillary vessels in the undisturbed part of the web in the same animal. The repeated application, however, of the salt to the same vessels, then shows some or later followed by retarded capillary circulation, or even by complete stoppage.—(See *Thomson's Lectures*, p. 68.) The results of other experiments made by this physician, and which coincide with the phenomena of Dr. W. Haller and Dr. Hastings, need not here be cited.

Now, with regard to those experiments, which consist of Dr. Thomson to justify an inference that moderate degrees of inflammation may be attended with an increased efficacy of the blood in the inflamed vessels. Dr. Hastings, as I have already said, objects, that the application of a stimulus to the vessels affected, ought not to have been discontinued before it was; because it is partially stopped in almost all instances, that

case as the fact is established that a strong flow of blood towards an inflamed part tends to aggravate the disorder, all difficulty ceases in assuming the true basis of relief in that theory of inflammation, which takes into due account a retarded state of the circulation in the diseased capillaries.

Let us now devote a few pages to the consideration of the means to be employed for the relief of inflammation.

Removal of exciting causes.—In all cases, the first requirement is to be attended to is the removal of all such exciting causes as may happen to produce them. If the irritation of a splinter were to excite phlegmonous inflammation, who would not at the same instant directly take away the extraneous body? It is similarly, but not so obvious, frequently some inflammation, and ought to be taken away as speedily as possible; ruptured vessels of bone often give rise to the abscess, and require removal; the head of a bone being out of its place, may press and irritate the joint, as well as a knee; and who does not immediately see the necessity of putting it back into its natural position? These and other similar exciting causes may often be detected and removed at once, and this is doing a great deal towards the cure, and even the prevention of inflammation. However, many of the exciting causes of this affluence are not of removable application; yet, though this matter is that itself, the process of inflammation must follow, as a kind of an *injury* operating, against which, the injured organization and tone of the part, with resistance, could not be resisted again. Hence, besides taking away the remote cause, whenever this can be done, it is proper to moderate, by other means, the increased action of the larger vessels, and to slow the velocity of the blood's motion towards the inflamed part.

Bleeding.—As there is reason to believe that too much inflammation is a greater quantity of blood is propelled towards the inflamed part than is the natural state, and especially so, that not less than a more powerful effort is checking the disease, than diverting the determination of blood to the part, bleeding must be a principal means of relieving inflammation; it lessens the action of the whole system; it cools, and, of course, of that part of it which is directly concerned in increasing the quantity of blood transmitted to the part affected. On the principle also of lessening the white mass of blood in the circulation, it must have a similar effect.

Bleeding, however, is often misapplied, especially when regarded as the only remedy for inflammation, and other steps are neglected. The general obstructive and remittent of the powers in weak constitutions, prove that bleeding is not invariably proper, and in such individuals it often appears as if their general debility and the difficulty of curing the inflammation, were a hint to their physicians. It is a common notion, that when inflammation is complicated with disorder of the chylopoietic system, blood should be taken away with great circumspection; yet, for its diseases I cannot recall, any more than I can reach for the truth of a common supposition, that cases of inflammation in children do not require bleeding to the same extent as similar cases in the country. The supposition is likewise to be doubted by the numerous part of the profession, and last year has improved than formerly upon practitioners, who are getting into the true notion of examining things with their own senses, not trusting to themselves.

A great deal of bleeding, with little pain and heat in the inflamed part, the probability of a long and tedious suppuration, as well as some other compound features, and the operation of the inflammation with a want of heat in the part, are particularly as signs to resist the first impulse should be sparing of this evacuation. Bleeding in suppurative acute inflammation, is not the best of all remedies and symptomatic relief is often given. When the patient is female, or very old, and when the action of the arteries can be easily removed—*Resection of the Arteries* (p. 15). However, bleeding is to be attended to with some caution, particularly if the patient has had a great deal of previous phlegmonous inflammation to remove. As in Leucorrhoea has explained even in febrile inflammation, the inflammation may depend upon constitutional causes, which are not removed by their removal, so it is followed by great reaction. Sometimes, after having associated

the fluids of patients, already labouring under febrile symptoms, because in the last period bleeding is the consequence of such inflammatory action, with the best effect—*Resection of the Arteries* (p. 15).

On the other hand, bleeding is rarely beneficial where the inflammation is accompanied with any previously existing disorder of the digestive system, when it is considerable in extent and degree, and attended with a great deal of morbid disturbance. The same practice is not so strongly indicated, when the part affected is very sensitive, and highly irritable; it is regarded in its effect in the system. Thus the blood must be freely employed in acute epistaxis, or inflammation of the eye, which is a most sensitive part, and in inflammation of the lungs, brain, or stomach, signs, the second side of which is essential to the regular maintenance of all the various operations in the animal machine; and if a successful effort be not promptly made to stop such inflammation by the most efficacious means, death itself will be the result.

In general, bleeding may be said to be indicated when the patient is young, robust, and phlegmatic; when the local and constitutional symptoms are severe; when the patient has been torpid, with an existing great deal of natural heat, so as to have a decidedly inflammatory diathesis (see *Leucorrhoea's Diagnosis*, p. 15). When the cause of the disorder can neither be removed nor dissipated, and when there is a strong motive for wishing to arrest the formation of matter. Inflammation of the eye is a good illustration of the truth of the last observation; for, if suppuration take place in this organ, the most common consequence is an entire destruction of its external structure and equilibrium, that the final destruction of sight is totally impossible. In the example falling under the conditions specified, we require blood to be taken away, if it is sometimes necessary frequently to repeat the evacuation.

The efficacy of bleeding is greater the sooner it is performed, and the more suddenly the blood is evacuated. Bleeding soon the part affected is usually more effectual than when done in a remote situation. Hence, in inflammation of the eye or brain, it is often conducted most advantageously to take blood from the temporal artery, or by cupping on the temples.

In severe inflammations, particularly those of the parts contained in the three great cavities of the head, chest, and belly, general blood letting (by a phlebotomy) is not the only, or the principal remedy, to which we can trust for a cure. The quantity of blood, which, in these inflammations, it is necessary to take away, varies according to the violence of the inflammation, the temperament, strength, and habits of the patient, and according to the structure, function, and situation of the organ in which it occurs. From twelve to twenty ounces, or even more, might generally be drawn every time we have occasion to do the blood in the cure of inflammation, and bleeding to this extent may be repeated two or three times in the course of the first twenty-four hours, according to the effects which it seems to produce, as well as according to the violence and urgency of the symptoms. In inflammation of internal parts, we judge of the effect of bleeding, and of the necessity of a repetition, from the feeling and continuance of pain from the state of the pulse, and also from the appearance of the blood which has been let draw.

A partial and in some instances an almost complete, cessation of pain takes place soon during the operation of blood-letting. This is always a favourable symptom, and indicates that the inflammation has made no great way very alarming progress. In some instances, the other form, pain, though considerable at the time of bleeding, becomes afterwards more sensible and the other symptoms of inflammation shade in nearly the same proportion, while, in other instances again, the pain is either not relieved by the bleeding, or, if relieved, the relief is but of short duration. These two are cases in which the other symptoms of inflammation remaining unaltered, because that be had again, in the use of the patient, and the next blood drawn can be done with safety to the patient.

The changes which take place in the state of the pulse, either with regard to the frequency or strength, during its use, after the abstraction of blood, though they afford evidence by which we may judge of the

Under the dissection of M. Louis, had two, three, four, and even five, volvuli, without any inflammation of the peritoneum or intestines leading to a suppurated abscess—effusion had been known during life. "These cases (says M. Louis) seem to prove that introsusception had been formed and destroyed again by the mere action of the intestines."—*Mé. de Chir. de Chirurg. Vol. 2. p. 364.* This opinion is confirmed by the authority of Dr. Ferris (*Med. Observ. 2d ed. p. 185*), who observes that "in opening bodies, particularly of children, an introsusception is not infrequently found, which had been attended with no mischief; the parts appear perfectly free from all inflammation, and they would probably have been easily disengaged from each other by these natural peristaltic motions." A rare instance is on record, where the disengagement required an incision.—(*Journal. de l'Association de Médecins de Paris, de Médec. GÉN.*)

The division, as Mr. Langstaff remarks, answers a more disjunctive, and indeed, generally, a final term, when it occurs at the termination of the small intestine is the terminus. A contracted state of the part to be introsuspected, and a division of that portion of the small intestine which this part must pass, are essential conditions to the division of a volvulus; and they exist seldom or completely in this disorder. The extent to which the intestine has protruded would appear almost impossible, if it were not proved by well authenticated facts. A person who contracted the rotatory situation was evidently, in the same, would of course require the surgical assistance before he could believe that the intestines, cecum, ascending and transverse portions of the colon, may be drawn into the sigmoid flexure of the small intestine, very near, that they may pass through the rotum, and be protruded in the form of a pseudotumour. Such cases, however, are recorded.—(*See Collins's Case in Phil. Trans. Vol. 75, and Langstaff, in Lond. Med. and Surg. Journal. No. 21.*)

This provision best relieves the case of a child three weeks old, the body of which he suspended after death, and found in confining the first of the preceding disorder. The malaise was particularly in these being in children an extensive introsusception, to be good may, a useful investigation in the morbid situation, the whole probably occurred in the case noticed by Mr. Berry.—(*Med. and Physiol. Journal. No. 21.*) Dr. H. Hare describes a voluntary introsusception, in which a nerve was found curled up round the introsuspected part. The disease took place in a boy who had strabismus.—(*See Trans. for the Improvement of Med. and Chir. Knowledge, vol. 1.*)

When the intestines were of a moderate size, the introsusception, as we call it, will most frequently happen downwards, although there is no reason why it may not take place in a contrary direction; in which case, the change of a state will be induced by the natural action of the intestinal canal leading to relieve the distension; and probably from this circumstance it may of itself sometimes necessary appear.

When the introsusception is downwards, it may be called prograde, and when it happens upwards, retrograde. The manner in which it may take place is, by one portion of a large intestine being contracted, and current intestine being relaxed and dilated; under which circumstances, it might very readily happen by one contracted portion displacing a little may be that which is relaxed, but from any action is either portion of intestine, or from some additional weight in the peritoneum. Now for the possible action, by passing the contracted into the contracted parts, might have these become relaxed, Mr. Harvey could not determine, but he was inclined to suppose that it did not have this effect.

By the action of contracting for an extensive introsusception, it may take place upon a small intestine downwards; but if a sufficient degree of contraction of it comes from the action of the intestine, it would be unless it is drawn upwards, as we might find in the case; but this point the evidence does not seem to establish. The portion of intestine appears to have been carried into the gut below, as we observe from the most complete dissection of the parts taken from the living subject. It is evident, as if there could be no doubt, the intestine, which comes down, was in the relaxed state, and the second or relaxed portion, when being reflected down again, passed the first or contracted part, that

is the situation, which is always in the natural position.—(*J. Hunter.*)

The natural fold is the only one which is alive, the inverted portion being perfectly passive, and agitated down by the action, which is the cause of it, so that the highest elevation of the intestine is at the angle of reflection of the intestine into the mobile portion or inverted one, where the constriction is found to be. From this we can readily see how, in a mesenteric, once begun, may have any length of gut drawn into it.

The external portion, acting upon the other folds in the same way as a springy extensible matter, with its peristaltic action upon these folds, and if any constriction is admitted is directed in the cavity of the lower portion, that part will become a fixed point for the mass or containing intestine to act upon. When it will be extended out, all at once the remaining part of the mass of the intestine part from being drawn in, will act as a kind of spring, yet without greatly hindering the movement of the fold from going into the gut. For a being the intestine fold that is acted upon by the gut, and the intestine contracting after the lower portion becomes fixed, the gut is thrown into folds upon itself, so that a fold in length of intestine that will be a springy point of support for the intestine fold.

The water portion of a spring is alone acted upon supporting the disease when the gut begins, but if the lower one were capable of equal action in the natural direction, the effect would be the same, that of contracting in length of itself, so that the gut, the upper and lower portions, by their action, would tend to draw in more of the gut, while the intestine part only moved, by its action, have a contrary tendency.

The action of the abdominal muscles cannot act in either direction or contracting this disease, as it would compress equally both above and below, although it is capable of contracting the peritoneum only.

When an introsusception begins at the valve of the colon, and extends into the intestine, as the case is not at all attended; which proves that the constriction, by acting in a way, prevents its extension.—(*J. Hunter.*)

From the natural attachment of the mesentery to the intestine, we would, at the first view of the subject, conceive it impossible for any one portion of gut to get the whole intestine; as the primary extent of mesentery that is carried in along with it, would prevent further entrance more and more difficult, and we should expect it was difficult to be greater in the large intestine than in the small, as being more closely confined to their situation; yet one of the highest introsusceptions of any known was in the colon, as related by Mr. Whistly.—(*Phil. Phil. Trans. Vol. 76, p. 283.*)

The introsusception appeared to have begun at the insertion of the ileum into the colon, and to have extended in the course with its appendix. The ileum passed on into the colon, till the whole of the ascending colon, the transverse arch, and descending colon were carried into the sigmoid flexure and cecum. The valve of the colon being the leading part, it was not gut as low as the apex; and when the person went to stool he only emptied the ileum; for one-half of the large intestine being filled up by the other, the ileum alone, which passed through the centre, discharged its contents.—(*J. Hunter.*)

Two questions of considerable importance present themselves to the mind in considering this subject; whether there are any conditions, by which the nature of the affection can be ascertained during life; and whether we possess any means of relieving it, supposing that its presence could be discovered. The symptoms attending an introsusception are common to inflammation of the intestine, peritonitis, and obstruction of the canal, from whatever cause, and a rupture is the least frequent cause of such symptoms. In the case published by the above physicians, and in those related by Mr. Hunter and Mr. Berry, the seat of the disease was clearly decided by a hard tumour at the left side of the abdomen. This circumstance, therefore, with the impossibility of evacuating the mass from any other quantity of fluid in the system (*Harvey, Opus. Anat. 1771*), and the pressure of the colon upon the rectum, would lead us to expect the nature of the disorder. If the invaginated portion descended so low as to protrude through the anus, and we could examine, and it was not an inversion of the gut, the case might

whenever writes a day. Mr. Buchanan gave 1j. of tincture of Iodine of cod-liver-oil, and keeps the tincture in the tincture of the medicine, as more efficacious and less likely to become rancid and other objectionable symptoms. He has often observed, that when degeneration of the retina, and great swelling followed the external application of the tincture, the parts involved were beneath that when the tincture remained in natural equilibrium—the *Iridioid* (Jodine), p. 343. 2. *Pain of Iodine*, made by mixing ten grains of Iodine with two drs. of oil, with either red or white wine; it is to be taken every morning and evening. 3. *Iodine external*, made by mixing a drachm of pure tincture with an ounce of Iodine, or half a drachm of Iodine, or pure with an ounce and a half of Iodine; of the former about a scruple, of the latter about an ounce in a pint, may be rubbed on the part in which it is intended to be applied. Dr. Nussbaum's ointment has 1ss of the hydriodate to an ounce of Iodine. 4. *Solution of hydriodate of potash*, formed by dissolving 30 grs. of the hydriodate in a quart of distilled water; it is given in the same dose as the tincture. 5. *Solution of the iodinated hydriodate of potash*, made by dissolving 30 grs. of the hydriodate and 10 grs. of pure Iodine in 10 drachms of water. The dose, in the beginning of its use, should not be more than 5 or 6 drops three times a day.

From Dr. Keble's *effluvia*, in the *Review Med.* for June, 1855, it appears, that the treatment is much stronger in France than that mentioned by Borel, two drachms of the hydriodate being mixed with an ounce of fat.

In administering Iodine, care must be taken not to combine it with substances calculated to decompose it, and only to let the patient take it when the stomach is empty. The liquid preparations are generally given by Dr. Deleade in syrup and water. When it effects arise from its local operation, such as pain in the stomach, chest, bowels, defective vision, loss of sleep, palpitations, tremors, convulsions, &c., or from its decomposition of a less dangerous kind, the medicine should be immediately discontinued. A still requires copious nourishing drinks, the usual food, and sometimes bleeding, are necessary. It is hardly necessary to observe, that the use of Iodine requires a great deal of caution, as several cases have happened in which the patients were poisoned with it.—(See *Ed. Med. Journ.* vol. 22, p. 555, &c.) When the bronchitis, or other disease, is also in a great state of irritation from the medicine, emollients, poultices and leeches are indicated.

Iodine has obtained considerable reputation for its efficacy in leucorrhoea, scirrhus, various chronic fevers, rheumatic pains, enlargement of the lungs, hiccups, anasarca, scirrhus, &c.—(See *Borel's Essai sur l'usage du Iodine*, a valuable treatise on the combination, Paris, 1822; J. R. Goulet, on the Effects of Iodine, in *Archiv. Med. et Pharm.*, a Translation of his first Memoir, by Dr. J. R. Adams, Lond. 1821. *Medical Periodicals*, vol. 3, Lond. 1821. *Medical Reviewer on the Effects of Iodine in Bronchitis, Parapneumonia, Scirrhus, Pseudo Leucorrhoea, Dropsy, Dyspepsia, White Scouring, and Diarrhoea of the Stomach*, by Allen, Adams, Rev. Lond. 1825. *on the Effects of Iodine in the Treatment of Chronic Leucorrhoea*, by Dr. Thomas Buchanan, Edin. Lond. 1825.)

IRIS, PERFORATION OF. A small incision, formed by the entrance of a portion of the eye through an opening in the cornea. It is sometimes attended with a prolapse of the iris.

The causes of this complaint are such wounds and ulcers of the cornea as make an opening of a certain extent into the anterior chamber of the aqueous humor, and such violent contusions of the eyeball as occasion a rupture of the cornea. If the edges of a wound in the cornea, whether accidental, made by the rupture of a corneal cyst, or otherwise, be removed the matter of repair, he will be kept immediately affected with increased opacity or opacity; but will not be able to see through the opening in the cornea. If the edges of a wound in the cornea, whether accidental, made by the rupture of a corneal cyst, or otherwise, be removed the matter of repair, he will be kept immediately affected with increased opacity or opacity; but will not be able to see through the opening in the cornea. If the edges of a wound in the cornea, whether accidental, made by the rupture of a corneal cyst, or otherwise, be removed the matter of repair, he will be kept immediately affected with increased opacity or opacity; but will not be able to see through the opening in the cornea.

or the cornea compressed by bandages, during the extension of a corneal wound of the cornea. Also, if the pupil should be affected, in this circumstance, with a spasm of the muscles of the eye, with violent and repeated vomiting, or with other and frequent vomiting, a prolapse of the iris may be caused. When an ulcer of the cornea possesses the intense character, the same circumstance happens more frequently than when there is a recent wound of that membrane. In the relation of continuity to the cornea, among those in which it is attended with loss of substance, and, in a membrane or mass and consequent to this, the edges of an ulcer do not admit of being brought into normal contact.

In persistent and venereal ophthalmia, where a permanent absorption of the cornea often occurs, the extensive irregularity of the iris, and consequent strabismus, Mr. R. Westlake conceives, might be prevented by the early application of belladonna; and, perhaps (he adds), where the ulceration is remote from the centre of the cornea, and very small, the iris may be kept widely diverged, till the progress of resolution prevent the risk of protrusion?—(Note in *Practical Medicine as a Science of the Eye*, vol. 2, p. 6, 11.)

The iris is more or less flattened when the iris, viz. broken or greatly being surrounded at its base by an opaque thick of the cornea, on which membrane there is an ulcer, or a wound of a very recent description.

As it usually happens that the cornea is only penetrated at one point in its circumference by a wound or ulcer, only one prolapse of the iris is commonly seen with in the same eye. But if the cornea should happen to be wounded or ulcerated at several distant points, the iris may protrude at several different places of the same eye, forming an equal number of small projecting tumours on the surface of the cornea. Scarpa has seen a patient who had three very distinct protrusions of the iris on the same cornea. In some instances of these separate ulcers protruding the anterior chamber, one in the upper and two in the lower segment of the cornea.

If, says Scarpa, the delicate structure of the iris, the great quantity of blood vessels which enter it, and the connection between them, which proceed to be thickened by it as a granular matter, be considered, the nature and severity of the symptoms may be readily accounted for, which are wont to attend this disease, however small the portion of the iris protruding from the cornea may be even if no larger than a fly's wing. The blood and cellular vessels in which the delicate membrane is thus wound, in consequence of the action of the vessels, together with the weight of the iris, and, again, it, are causes which operate in the production of external irritation; and the blood which leads to the point of the greatest injury, cannot fail to render the protruding portion of the iris much larger, when directly against pressure, than it was at the moment of its first passing through the cornea. Hence, it soon becomes more increased and enlarged. In the intense state of the disease, the patient complains of a pain similar to what would arise from a pin penetrating the eye, and he begins to experience, in the same time, an oppressive sensation of tightness or constriction over the whole eyeball. Inflammation of the conjunctiva and eyelids, a burning effusion of tears, and an absolute inability to endure the light, necessarily take place. As the protruding portion of the iris drags after it all the rest of the membrane, the pupil assumes an oval shape, and the iris, from the centre of the iridodivision, is cut of the prolapse. The intensity of the pain, increased by the inflammation, and more especially, the adhesion, always continues to increase.

Instead of protrusion of the iris, an often-occurring, where, after the disease has been left to itself, the iris and membrane are completely absorbed, and the eye is now become nearly insensible.

In the early stage, when the iris is not yet enlarged by means of a white membrane; and, in case of all truly, a dilatation of the pupil is often of the nature to be made proportioned to the obliquity of the case as a base for the origin of a permanent iridodivision. Often only temporary dilatation of the protruding portion of the iris, with the view of keeping it distinct and white with the eye, or suddenly opening the eye affected to a very vivid light, in the

while, amounts to maintaining an equal and effective pressure upon the gum, by which means, they are confined to their place, little depression is made for them, and the granulations hindered from rising. Compression of pulp-tissue and other tend will often be found almost useful. Their plan is the worst one of preserving the large tissue healthy, and the most likely to enable patient of the disease and repeated suffering, with the fresh application of the rubber, or the use of stimulating remedies, in order to renew the gum and replace the famous flesh, unobtainable otherwise.

There is a method of making truss with the elastic made into a sort of plate, which is laid upon the gum left, supported by the adhesive plaster. It seems to me to be a more tedious and painful plan, and I do not recommend it.

It has been suggested that, the pain arising from the elasticity might be lessened, by adding opium with the application; but the idea seems not at all probable; the destruction of a part of the skin must inevitably cause considerable pain, with whatever substance it is produced, and opium itself, so far from being likely to diminish the agony, is itself a violent stimulus, when

applied to the skin, and in contact with the exposed extremities of the nerves.

The treatment is derived from two sources, and the efficacy of having them open for a length of time, as is often thought, is a very common error, supposed to express a variety of other methods of making truss, less applicable in the present and the future, attendant. Some of these operations are being affected by, and I will add another, which I have adopted for a number of years with satisfaction, and for which I am indebted to Dr. P. H. Rogers of Williams and Gray College, Virginia. Two truss is made by the elastic pressure of making the skin very tight of the patient's face, and the truss is made, until at least, all the surface is destroyed as it is necessary. The pressure is effected in about five minutes, at constantly applied; and its perfection is known by the black and hoary aspect of the surface. Its property may be instantly neutralized if necessary, by washing the part with vinegar, and the effect comes. A position is then applied, and at night or on days there is a slight tension off, when it may be dressed with warm ointment, which will keep it open indefinitely.—Rogers.]

J

JAW-BONE, AMPUTATION OF CONSIDERABLE PORTIONS OF THE LOWER. This operation, which is one of the achievements of modern surgery, was first performed, by Dr. Mead, of America, and it has since been done by Delapierre, Gervais, Lallemand, Remy, M'Donnell, Lecom, Goussier, Crook, Boudan, Wyman, Randolph, J. K. Rogers, Keane, and others.

The operation of amputation of the lower jaw, one of the most formidable in surgery, was first first performed by Dr. Mead, although Mr. Cooper, in his "First Lines," has attributed it to Delapierre, and the "Philadelphia editor" (last summer) and of the last edition, mentions it to Dr. Henshaw of Tennessee. It is a very strange, that during various cases distinguished between amputating a "part of the lower jaw" and that part of the operation, and the amputation of the bone at the articulation. They commonly they perform operations among their symphyses, but I suppose if they continued the little operation on the living patient, they will never again produce their identity. Failure was never, fear. Dr. Mead is not only the first, but the only surgeon, who has suggested and done successfully at the articulation, (except where Dr. Crook, of Delays. The removal of a part of the bone has been very often performed, even in this country, and although I am one of those who have removed a part of the bone successfully, and that part extending from the triangular ends of the left side to the angle of the right, yet it would be premature to suppose that the difficulty and hazard of removing it at the joint is such a considerable and some fatal operation. And, removing a part, it may be safely affirmed, that had not Dr. Mead demonstrated the possibility, many of those who now discuss very freely of the faculty of its performance, and even profess to give instructions as to the mode of operating, and sometimes venture upon the operation, would themselves shrink at proposing to remove this bone at the joint, even when the causal artery was secured.

The propriety of tying the vessel, as a preliminary step in this operation, or its necessity at least, may be questioned. Dr. Wood has lately performed the same operation without tying the vessel, and by experience is convinced that it would be unnecessary in cases in which he would directly take thought it indispensable. There may be some of the disease for which this operation is necessary, in which, from the position of the disease, and the extent of the result, it would be unwise to proceed in the operation without tying the vessel; in general, however, it may be dispensed with. I treated some years since, in removing a piece from the neck, I succeeded by tying the vessel, and from the moment I commenced successfully afterward, in cutting off the tumour, I was well satisfied that the

advantage whatever had been derived from the ligature to that vessel; and I have never since thought it essential to repeat it; although I have often treated several of our jaw and neck, for which it is said to be necessary. But so to the vessel at one time, and then with a few days before proceeding to the operation, it is the danger of surgical folly; and it is surprising to hear this course recommended by very high authorities. Experience will convince any operator that the circulation will be greatly restored in a few hours, as though his ligature were in his pocket.

In preparing the lower jaw, it has been found that the subsequent management of each individual case, has been a great requisite—much skill and attention. More than one of the cases which have occurred unfortunately have been attributed to the effect of degeneration, which became necessary before the parts had healed. Indeed, the wound made by the operation is so extensive, and the adaptation of the parts so important in nature, that every day's neglect to expose the part, even the subject should be suffered to pass into the stomach. Hence the subject is directed to lie on the side, so that the subject may have control the mouth, instead of submitting to the throat.

The patient on whom I operated in April, 1829, was in that month, and 60 years of age. At the time of the operation he was so reduced by starvation and loss of sleep, consequent upon an other hemorrhage from the jaw, which obstructed digestion, and impaired the circulation, that I would not have hesitated upon its removal, if I had designed to deprive him of food even for six days, in succession direct. I knew there would be a tendency for food and drink of cordial and nutritious character, and accordingly half an hour after the operation, I introduced the stomach tube of elastic gum, and then passed into the subject's half a pint of wine and water. It was passed, without inconvenience, several times a day for the first week, and brandy, coffee, chocolate, soup, and other fluids then introduced, until the eighth day, when he could swallow with ease, without using having already taken place, from the quiet state in which the parts had been kept. I approved the use of the stomach-tube, in these cases, will remove much of the labour attending them, and be found greatly to promote the rapid recovery of the patients.—(See note on article *Osteo-Myeloma*—Rogers.)

JOINTS, DISEASES OF. The joints are subject to numerous diseases, which are more or less dangerous, according to their particular nature. Like all other parts, the joints are liable to inflammation and abscess; their capsules frequently become distended with an aqueous secretion, and the disease termed *Hydrops articuli* is produced; but the most important of all their morbid affections are the ones which a few years since were indiscriminately called *gout* and *ar-*

right, symphysis joints, and the distance of the hip-joint, those, as Mr. Brodie remarks, the same cause has been frequently applied to different diseases, and the same disease has received different appellations. And confusion with respect to the diagnosis always gives rise to a corresponding confusion with respect to the employment of remedies. Although, says he, diseases in their advanced stages extend to all the distal parts of which the joints are composed, still, it is not the case in the beginning. Thus, as elsewhere, the morbid action commences, sometimes in one and sometimes in another ligament, affecting in their nature, and, of course, requiring to be differently treated, according to the mechanical organization and vital properties of the part in which they originate.—(See *Pathological and Surgical Observations on the Joints*, p. 2, New-Land, 1816.) It was this idea, which led Mr. Brodie to trace by dissection the canal paths in which several of the principal diseases of the joints commenced, and here, with light and discrimination, his successful investigations have produced, it is needless for me here to insist upon, as his merit will long be acknowledged by every surgeon, who reflects the perplexity and ignorance which prevailed only a few years ago in this very interesting branch of surgery.

Wounds.—By the wound of a joint, surgeons mean a case where the capsular ligament is penetrated, or divided. The injury is often accompanied with a division of the ligament at other ligaments, and sometimes also with that of the cartilages and bones. That the capsular ligament is wound it may generally be inferred by the introduction of a probe, and frequently by a discharge of a transparent viscid fluid, called the synovia. But as a serous discharge may proceed from some wound of the bony surface, we might then be as erroneously judged, as we are unconquered with the situation of these fine tendinous bags. I am, at this present hour (Aug. 1822), attending a patient, whose leg was situated in a very serious laceration of a superficial laceration of the skin of the knee by a fall. A small abscess formed below the patella; and, very soon it burst, a considerable quantity of fluid, resembling white of egg, and evidently secreted by the neighbouring bursa, has been daily discharged without pain. Brodie has seen several cases, in which a fluid, resembling synovia, was discharged from wounds of the sheath of tendons.—(See *Virchow's Medical Observations*, 2. 4, p. 482.) Here the injury which I have given in another place (see *Remarks on the Abscesses*), reducing the severity of being too efficacious with the probe is equally important, inasmuch as the rough introduction of this instrument into a large joint, like the knee, would be likely to excite inflammation of the synovial membrane, and a train of dangerous and even fatal consequences, while the information gained by such employment of the probe is of little use; because whenever it is used is supposed to reach into the capsular ligament, exactly the same treatment should be followed, as if the joint were positively known to be penetrated.

Nevertheless simple wounds, even of large joints, often heal favorably, without any bad symptoms, this is not constantly the case, and the records of surgery furnish every example in which the most interesting and fatal consequences ensued.—(See *Wheeler's Commentaries*, part 3, p. 53.) When properly treated, painful wounds of the joints (says Brodie) are not in general attended with danger; but, in some of these wounds, which were apparently quite simple, have been followed by very bad symptoms, and even death, we should always be extremely on our guard in the prognosis.—(See *Virchow's Medical Observations*, 2. 4, p. 486.) The treatment consists in endeavoring to heal the injury by the first intention; or applying cold and sea-bath; and, in some of the parts; and employing bleeding and other antiphlogistic remedies.

Brodie observes two cases of fractured osseous of the knee joint, which healed up in a few days, without any extraordinary symptoms. He acknowledges, however, that these accidents are not always so untrifling, and that their consequences are sometimes serious.

Should indeed wounds prove very serious, particularly, viz. that of wounding the part by the first intention. At the moment of the accident, some of the synovia is discharged, indicating that the capsular ligament is wounded. Should this discharge not have been noticed at first, the surgeon may see the synovia flow

out again, if he move or press upon the joint. But, in making this examination, the greatest care must be used, not the irritation of the tendons ligament be increased. When the wound is large, and there is no considerable thickness of soft parts, the particular wound may extend to view.

The prognosis of an injured wound of a joint is not generally unfavorable, when the slices have been immediately brought together, the cavity of the joint not been long exposed, and blood is not effused into it. This last danger is also dangerous, as it is not noticed in speaking of collections of blood in joints. With these exceptions, says Brodie, the wound may heal as readily as if the joint were not opened; and he has cited several facts in proof of this statement. In such a case confirmed by the success which similar operations produced for the purpose of extracting extraneous substances from the knee. Nay, very bad cases sometimes recover under judicious treatment, even though the joint be large, and somewhat torn. Thus I saw, in St. Bartholomew's Hospital, in May 1821, two examples of compound fractures of the patella, where the capsule is the capsule was so thick, that the finger could hardly pass over the surface of the joint, yet, after large abscesses, a great deal of bone, and separation of bone, the patients recovered with stiff joints. But I would advise surgeons to be very cautious in this kind of procedure. Brodie is the most recent of patients treated of the large joints, when, in the circumstances already mentioned, the dislocation and gunshot wounds, are the same. In a case of a fall, the capsule of the knee joint was torn by the first intention. The rest of the longest consists in using every possible means for the prevention of inflammation, by perfect rest of the part, the use of cold applications, &c.

Let it be remembered, however, that wounds of the joints do not always heal in the above favorable manner. Even among these cases which appear the most slight and simple, there are but too many which are followed by more aggravated symptoms, as effusion of synovia or effusion of a necessary secretion. In other instances, if a too gross description, when the patient is cured, the termination of danger is not without an embolism, by which the motion and functions of the joint are permanently destroyed.

The experienced Mr. Brodie has noticed wounds of the joints, and made some pertinent remarks on the subject. He states, that, in these cases, no more care should be taken to prevent inflammation. "Upon this observation chiefly depends a successful termination. I have seen many cases, many large wounds of the great joints healed without the expectation of any dangerous symptoms, where danger has been taken to prevent inflammation; while, again, apparently trifling, well often be followed by a train of distressing and dangerous consequences, when such care has been neglected. It is generally easier to prevent inflammation in the joint after it is wound, than to cure it, progress when once begun. I speak now of inflammation affecting the capsular ligament. A slight degree of redness and tenderness in this neighborhood is of little consequence; but when the capillary system becomes inflamed, the formation of abscesses, attended with a high degree of fever, and ultimately a stiffness of the joint, are the common consequences, if the effort of the patient is prevented."—(See *Practical Observations on Surgery*, p. 254, edit. 2.)

For facts in confirmation of the foregoing Account, I particularly refer to several cases printed in the two publications, p. 255, 256, &c., and by Brodie.—*Treatise on Med. Chir.* (p. 425, &c.)

When the large joints, particularly the knee, are wounded, the stomach is frequently very much affected. Formerly, says, under the care of Mr. Bond of Newbury, a sick man, in the occupation of a brick maker, happened to give himself a wound, by which one side of the knee was laid open, a great deal of constitutional disturbance and of debility, and suppuration ensued; but what particularly struck me was the manner in which the stomach was so affected.

In speaking of dangerous substances in the joint, I shall have occasion to advert again to the danger of treating on wounded joints, and the same fact is still further considered in the articles *Dislocations*, *Fractures*, and *Gunshot Wounds*, &c.

which last part of the Dictionary the weakness of bones, ligaments, and other tissues to military surgery, are laid before the reader.

Inflammation of joints. If an episode from consideration specific cases, may be said usually to be the consequence of a contusion, sprain, wound or some other kind of injury; but with respect to the inflammation of the synovial membrane, as described by Mr. Brodie, an cause is so frequent as the application of cold, and almost to exclude the frequency of this disease in the knee, and its rarity in the hip and shoulder, which are covered by a thick mass of flesh. As a late writer observes, the inflammation arising from a wound is distinctly the same event after it, but was unattended—(*Lancet on Inflammation*, p. 157.)

The inflamed joint shews the common symptoms of inflammation: viz. puterential pain, increased heat, throbbing pain, and swelling, while the constitution is also disturbed by the common symptoms of inflammatory fever. It deserves notice, however, that as these upon the constitutional symptoms are often exceedingly acute, and the pain is some frequent, and sometimes full and strong, than when parts corresponded to nature in a state of health are affected. The inflammation first attacks some part of the capsular ligament, and very quickly spreads over its whole extent, as usually happens in all inflammations of smooth serous membranes.

The capsule of the joints is generally not very sensitive; but like every other part, similarly circumstanced, they often become acutely painful when inflamed. The membrane is accompanied with an increased secretion of the synovia, which becomes of a more aqueous, and of a less albuminous quality, than it is in the healthy state. Hence, it is now well estimated for increasing the articular stiffness, and preventing the effects of motion, as it is in the structural condition of the joint; a circumstance which may explain why a gelling sensation is often perceived on moving the parts.

The capsular ligaments, like other parts, are frequently thickened by inflammation, and sometimes completely tough being effused on their internal surface, organized cartilaginous or osseous bodies are formed within the joints.

It has been explained by Mr. Brodie, that the usual consequences of inflammation of the synovial membrane, or capsular ligament, are: 1. a puterential secretion of synovia; 2. an effusion of coagulable lymph into the cavity of the joint; 3. a thickening of the synovial membrane, a decrease of its folds a substance resembling gristle, and an effusion of coagulable lymph, and probably of serum, from the cellular structure, by which it is connected with the external parts. The three professions has seen several cases where, from the appearance of the joint and the symptoms, there was every reason to believe that the inflammation had produced thickening of the reflected folds of the membrane; in such cases: and, in dissection, he has occasionally observed adhesions which might have arisen from inflammation at some former period. "The effects of inflammation of the synovial very much resemble those of inflammation of the serous membranes. There are, however, some points of difference. In the former, I have reason to believe that separation rarely takes place independently of dissection; but this is a frequent occurrence in the latter. Inflammation of the peritoneum is pleura, though very slight in degree, and of very short duration, terminates in the effusion of coagulable lymph, but this is seldom the case in inflammation which has its seat in the serous membrane of joints."—(*Med. Clin. Phil.* vol. 4, p. 183.)

When the inflammation attains a high pitch, an abscess very soon in the cellular apparatus, which is latent beneath, and the pus makes its way beneath the skin, and is either in this discharged through abscessed openings.

An abscess rarely takes place in an important articulation, in consequence of mild inflammation, but when the process being more advanced than the itself is invariably endangered. Some severe symptoms always attend the process, and are usually followed by suppuration taking place, death itself ensues. Two steady fatal cases of abscesses of the synovial membrane, whose matter had formed within a few days of the hip, and a suppuration of the shoulder, are recorded by Mr. Brodie.—(*See Pathol. Clin. Phil.* p. 184.)

In these cases, the inflammatory fever is very quickly converted into the hectic, which, when an abscess has taken place in a large joint, is consequence of suppuration, hectic symptoms being immediately brought to view themselves, and the absorption of the contents of the inflammatory fever suddenly ceases.

Local consequences, even when these above described, may follow inflammation of a joint. As the liver of the ligament ligament reflected over the cartilages of the articulation is often inflamed, the cartilages themselves may have the inflammation communicated to them. Parts of a cartilaginous structure, being very incapable of bearing the influence of disease, often abscess, or, in other words, are absorbed, so as to leave a part of the whole of the articular surface of the bones completely denuded of its surface covering. At length the ends of the bones themselves become inflamed and become carious; or the consequence may be ankylosis. Mr. Brodie has seen some cases in which there was extensive destruction of the cartilages, apparently in consequence of neglected inflammation of the synovial membrane, but he believes that, in most cases where absorption of the cartilage is combined with such inflammation, the former is the primary affection, and the latter takes place subsequently, in consequence of the formation of an abscess within the joint.—(*Pathol. and Surg. Phil.* vol. 4, p. 17.) According to Mr. Brodie, he speaks chiefly of the inflammation which begins in the synovial membrane itself, and is not communicated to it from other sources, the disease very seldom attacks young children, but is frequent in adult persons, the nature of what happens in some other diseases of the joints.

The inflammation of the capsular ligament, in synovial membranes, frequently assumes the chronic form, and in this very often combined with other more serious suppuration, under the general appellation of white swelling. The disease often arises from cold, and hence is more common in the knee and ankle than in the hip or shoulder. It may also arise from the introduction of air or mercury, and, in particular, constitutions, from rheumatism, and general morbidly of the system. In these instances, it often leaves one joint not attacked another; and it is less severe, and less disposed to produce effects of coagulable lymph, in a thickened state of the membrane, than when it is accompanied by a local disease.—(*Brodie*, in *Med. Clin. Phil.* vol. 4, p. 183.) In the latter case, the disease is more likely to assume a severe character, and may be of long duration, leaving the joint with its functions more or less impaired, and occasionally terminating in its total destruction. The following are the chief symptoms of the complaint, pointed out by Mr. Brodie. At first, although sometimes a full over the whole joint, the patient feels a pain only in one spot, and it is not at its height before the end of a week or ten days. Sometimes, even at this period, the pain is trifling, but sometimes it is considerable, and every motion of the joint is distressing. In a day or two after the commencement of the pain, the joint is affected with swelling, which at first arises solely from a collection of fluid in its cavity, and in the superficial joints an effusion may be distinguished. However, after the inflammation has prevailed some time, the fluid is rendered less perceptible, either in consequence of the synovial membrane being thickened, or the effusion of lymph; and the more solid the swelling is the more is the bulkiness of the joint increased. The form of the distended joint does not correspond to that of the heads of the bones; but as the swelling is chiefly caused by the distension of the synovial membrane, it is lighter depends in a great measure on the amount of the synovial and fluid, which render it is certain distension, and allow it to take place in others. Thus, when the knee is affected, the swelling is principally observable on the anterior and lower part of the thigh, where there is only a yielding cellular structure between the osseous masses and the bone. It is also often considerable in the spaces between the ligaments of the patella and the lateral ligaments, because at these points the fluid accumulates is impeded completely by the collection of fluid. In the elbow, the swelling appears principally about the olecranon, under the extensor muscles of the forearm; and in the ankle, it is between the lateral ligaments and the tendons in front of the joint. In the hip and shoulder, where the distension is less frequent, the fluid tends to fill, but the

swelling is perceptible through the muscles. In the beginning of the disease in the hip, a fissure both in the joint and in the skin may be remarked; but afterwards the pain becomes flaccid, and the patient would soon want of rest. The pain is usually confined to the hip, but Mr. Brodie has seen cases in which it was also referred to the knee. It may be distinguished from the case in which the cartilages of the hip are affected, by observing, that the pain is more severe in the beginning than in the advanced stage of the disease; it never ascends to the extracapsular articulation, but in the other disease; and it is aggravated by motion, but not by pressing the cartilages against each other. The tracing of the pain is also preceded by a fulness of the veins. After the inflammation has subsided, the fluid is absorbed, and the joint frequently regains its natural figure and mobility; but in the majority of cases, stiffness and swelling remain, and the patient continues very liable to relapse, the pain returning, and the swelling being increased, whenever the patient exposes himself to cold, or exercises the joint a good deal. In cases where the synovial membrane is the lesion, a slow kind of inflammation continues in the joint, notwithstanding the fluid has been absorbed, and the principal swelling has subsided; the disease of length extending to the tendons, ligaments, and muscles, and the articular surfaces being completely destroyed. According to Mr. Brodie, at the advanced stage, the history of the disease, and not its present appearance, is chiefly to be relied on to determine whether the primary affection was inflammation of the synovial membrane, or of the cartilages. Though such is the most common situation of inflammation of the synovial membrane, it is admitted, that its nature is sometimes more acute, exhibiting the symptoms mentioned at the beginning of this section.—(*See Part II. and Surg. Obs. p. 21, 6c.*) He remarked by Mr. Wilson, that, when synovial inflammation is the cause, the white of it does not always adhere to the inflamed surface, but some of it does follow, which fluid in the fluid within the joint, is more liable to be absorbed, but through its capillary ligament. In other instances, the lymph becomes solid, adheres to the inside of the synovial membrane, and becomes permanent. The variety of new structures coming in successive growths, but occasionally a firm thick protecting mass, of different degrees of thickness and length, and as numerous as is desired every part of the original smooth surface of the synovial membrane, an exception is a preparation in Wundt's Museum.—(*See the Plates and Diagrams of Bones and Joints, p. 219.*)

When inflammation of the synovial membrane has arisen from a sprain, or all combined causes of injury, Mr. Brodie recommends a trial of sanguification; and when the disease is connected with rheumatism, the medicines adapted to combat this disposition, preparations of carbonate of ammonia, and other mild remedies for rheumatic eruptions. In some instances, however, in which several joints were affected, this preparation has known benefit follow from moderate doses of mercury.—(*Id. p. 31.*) But whether the disease be local, or dependent on the state of the constitution, Mr. Brodie considers topical remedies of great importance.

It will considerably shorten what we have to say concerning the treatment of inflamed joints, to observe, that, in the acute form of inflammation (the synovial membrane, the arthritic place, &c.) the full force of the expression is to be strictly adopted. But as there is a variety of cases often admitted to the same purpose, it seems necessary to offer a few remarks on those which lay the greatest claim to our consideration.

There are not many surgical cases in which power and especially topical bleeding is more strongly indicated. The violence of the inflammation, and the strength, age, and state of the power, must determine with regard to the use of the lancet; but the application of leeches may be said to be universally proper. When the leeches fall off, the bleeding is to be renewed by drawing the gum. The patient should rest in his bed, and until the acute stage of the inflammation has subsided. As Mr. Brodie observes, attention should also be paid to the state of the bowels, and saline draughts and diuretic medicines to be followed.—(*Part II. and Surg. Obs. p. 32.*) In connection with this treatment, the following practice may be employed.

In a few instances, however, the patient seems to derive more ease and benefit from the employment of compressions and emollient positions, which, according to Mr. Brodie, is the case when the swelling has been produced rapidly, and is attended with remarkable tenderness. But on this point, as I have mentioned is speaking of inflammation, the feelings of the patient should always be consulted; for, if the pain is materially alleviated by this or that application, the employment will hardly ever be wrong.

Nothing seems need be said concerning the use of the treatment proper during the violence of the inflammation, as the duty of the surgeon is not uniformly different from what it is in other cases where signs of importance are indicated.

As soon as the violence of inflammation has subsided, the great object is to remove its effects. Therefore a flaccid state of the capsule, ligament and parts surrounding the articulation, a stiffness of the joint, and pain, when it is moved; fluid in the capsule, &c.

At first, as Mr. Brodie has observed, the joint should be kept perfectly quiet, and blood should be removed from the joint, by means of leeches and cupping. The latter is the method in which the preceding writer gives the preference. The use of cupping is reported by Mr. Brodie to be continued until the inflammation has been abated, when a blister may be applied, and kept open with the same issue, as a preventive of future relapse, as performed by Mr. Brodie. "The blisters the day, though of considerable size; and if the fluid be depressed, they may be repeated as soon as it is possible; but otherwise with little success. Thus, when the synovial membrane of the hip is affected, they may be placed on the groin and thigh; but when that of the wrist is inflamed, they should be applied on the convex part of the forearm." Mr. Brodie thinks blisters have more effect than any other means in removing the swelling, but, extending to very light cases, for very highly constant this are supported by the observations of Boerhaave. After the subsidence of the inflammation, moderate exercise of the joint and stimulating liniments are recommended. The chapter on this is not completed, with the addition of leeches, cauteries, or thermal lotions, or the following formula, adopted as that in which the above principles seem to give the preference. R. Oculi vitæ 5ss. coll. sulph. 3ss. M. In this stage of the disease, I had the practice of holding compresses considerably dry, particularly when loaded with the weak liniment in the proportion of 1j. to 3j. Mr. Eschscholtz agrees for the use of Oculi vitæ to the leeches, and his words represent it as being rapidly absorbed from the surface of the skin, and acting very powerfully in dissipating the thickening and induration of various ligaments and sinews of the joints. Indeed, he orders such application of leeches in its several eruptions, and states that its effects are produced without the use of friction, so that it admits of being employed with advantage even when inflammation is present.—(*Essay on a New Mode of Treatment of Inflamed Joints, by Lind, 1802.*) Mr. Brodie speaks favorably of the effects of the antimonial ointment, in the proportion of 1j. of the vitæ, and 3j. of the antimonial. The use of good mercurial liniments as constant means in preventing relapses. Issues and sinews are very accessible, as the operation of the cartilages has light. For the removal of the remains of the swelling and stiffness, Mr. Brodie joins other writers in preferring the efficacy of blister and cauteries. The disease may be aided with compressed mercurial ointment with powdered starch; but the friction is to be moderate with caution, as otherwise it may produce a state of the inflammation. When this happens, it is to be discontinued, and blood taken from the joint. Mr. Brodie, who Mr. Brodie appears to consider highly liable to relapse to cases where the disease remains upon the state of the inflamed parts, than to cases where it arises from disease in the joint itself. With regard to the plan of allowing a course of warm water to fall on the part, as suggested by Dr. Brou, and followed in the watering places, he allows that it is beneficial, but that it requires the same caution as the employment of friction.—(*Part II. and Surg. Obs. p. 33, 4c.*)

Before and with several instances in which I have composed of single and moderate amounts of leeches, and for the removal of the chronic inflammation, after the acute stage of the disease. The practice of

swelling of joints are also valuable applications; and they may be extended upon other instances, which will thus be rendered more efficient.

The serosity of the constitutional symptoms is mostly, if not always, greater when the inflammation of a large joint arises from a wound, than when it is the consequence of a lesion of vessels.

Large Cartilages in Joints.—Hard, rounded, or flattened bodies, chiefly of a cartilaginous nature, are sometimes formed within the capsular ligament, occupying some or less parts in the affected joint, and a considerable impediment to the freedom of their movements. The disorder, though not noticed by any of the very ancient writers, is not from being common. Pank is the first who speaks of it; he says, that a hard, polished, white body, of the size of an almond, was disengaged from the knee of a patient, in the year 1520, in which he had made an incision for an abscess upon the patella, about a hydropic antrum. (Linn. 25, chap. 1, p. 272.) A banded, and three times three afterwards, viz. in 1611, Pechin published the full details of another case, in which a cartilaginous body was successfully extracted from the knee. (Ullmann, *Physica Med.* vol. 26, p. 376.) Dr. A. Mead, in 1720, described the knee-joint of a woman, who had been blind, and found in the articulation a cartilaginous body, of the shape and size of a small bone. These were the only examples of the disease known before the year 1740, at which period Mr. Stagnut cut out of the knee a staphylo substance, which he supposed of the size of the operation was only beneath the skin. (Stagnut, *Med. Essays*, vol. 1.) But of late years the disease has been frequently noticed and described, successively by Bonard, Boer, Mikulic, Goussier, First, House, Bell, Abernethy, and Berd, in England; by Bonard, Thiers, and Laffay, in Germany; and by Bonard, and Salomon, in France. Hence, as before remarked, it is now so well known, to most others, to whom the joints are subject.—*Trans. du Med. Chir.* 4, p. 424.

Such bodies do not resemble cartilages, are not peculiar to the knee, as they occur in other joints; yet they are most frequently met with in the knee, and it is in this joint that they produce symptoms which render them the object of a surgical operation. Morgagni and B. Bell met with them in the ankle. Haller in the joint of the jaw, and they in the elbow.

According to Mr. Richard Brown, these substances are anomalous in their structure to bone; but in their external appearance they have a greater resemblance to cartilage. They are not, however, always exactly of the same structure, being in some instances softer than in others. Their external surface is smooth and polished, and being lubricated by the synovia, allows them to be moved readily from one part of the joint to another. They seldom remain long at rest while the joint is in motion; and when they happen to be in situations where they are pressed upon, with force by the different parts of the joint, they occasion considerable pain, and extremely interfere with its necessary actions.

The resemblance of their being loose, and having no visible structure, made it difficult to offer good conjectures respecting their formation; and according to Mr. E. Brown, so extensive a number of their origin had been given when Mr. Hunter made his observations. In the course of his experiments, instituted with the view of proving a living principle of the blood, Mr. Hunter was naturally induced to attend to the phenomena which took place when that fluid was extravasated, whether in consequence of accidental violence or other causes. The first change he found to be coagulation; and he supposed thus formed, it is covered with living parts, and we presume are identical, similar to tubercles, cancer, &c. was it dissolved and taken back into the circulation, but in many instances proceeded in living power, and would occasion an erysipelatous inflammation from the neighbouring blood vessels in the adjacent parts; it afterwards underwent changes, rendering it similar to the parts to which it was attached, and which supplied it with nutriment. When suppuration added to a surface which owed its position, the affected part was rendered in some instances puscular, and in others it was merely broken.

Hence it was easy to explain the manner in which these gelatinous bodies are formed, which are sometimes attached to the sides of the synovial cavity,

and the principle being established, it became equally easy for Mr. Hunter to apply it under other circumstances, that it is evident from a known law in the animal economy, that extravasated blood, when first dissolved as separated part of the body, and before the nature of the parts into which it is effused, and consequently the many coagulum which is thereby effected might form a soft tubercle, would, when situated on a bone or in the neighbourhood of bone, afterwards be a hard one. The cartilages found in the knee joint, therefore, appeared to him to originate from a deposit of coagulated blood upon the end of one of the bones, which had acquired the nature of cartilage and had afterwards been separated. This opinion was further confirmed by the examination of joints which had been violently strained, or otherwise injured, where the patients had died at different periods after the accident. In some of these cases there were small gelatinous parts, particularly found, as he had to examine, and to distinguish to be chiefly knocked off by any sudden or violent motion of the joint.—(Trans. for the Improvement of Med. and Chir. Knowledge, vol. 1.)

Mr. Brodie met with three cases, however, in which the loose bodies were of a different nature, and had a different origin from that referred to by Mr. E. Brown. Sometimes he met with a bony nodule in the knee, like a small cartilage, seated the margin of the cartilaginous surface of the joint. In the two examples related by him, the tubercle grew of bone and taken place, and, in consequence of the motion of the parts, portions of it had been broken off and lay loose in the cavity of the joint.—(Litt. and Chir. Trans. vol. 4, p. 278.) And in a more recent publication by Berwick, that in the majority of cases which he has met with, no inflammation preceded the formation of these gelatinous substances, and therefore he thinks it probable that, in some instances, they are produced like other tumours by some different process. He further observes, that they appear to be seated originally either on the internal surface, or in the substance of the synovial membrane, where, before they become detached, a thin layer of the latter may be traced over them.—(Pathological and Surgical Ess. p. 294.)

One or more of these gelatinous bodies may be formed in the same joint. So E. Brown mentions one instance in which there were three; they are sometimes about the size of a horse bean, often much smaller, and sometimes considerably larger; when very large, they do not give so much trouble to the patient as the smaller kind. A soldier of the 5th regiment had one nearly as big as the potato, which occasioned little uneasiness, being too large to disengage itself from the lower parts of the joint. Morgagni saw many of these in the left knee of an old woman, who died of apoplexy, and Haller met with no less than twenty, in the articulation of the lower jaw. When there are several in the same joint, it is observed, that their size is generally small.—(Esper, *Trans. du Med. Chir.* 4, p. 426.)

The diagnosis of this disease, as Brown observes, is seldom attended with any difficulty. When the formation of the extraneous substance follows a fall or blow upon the joint, the complaint begins with a swelling of the surrounding soft parts, and upon the subsidence of this swelling, which lasts for a few days or less, both the presence of the false cartilaginous tumours is indicated by certain symptoms which are peculiar to them. In persons who have had no blow but fall upon the knee, the disease sometimes commences with a more or less acute pain in the joint, with or without swelling of the surrounding soft parts, and which afterwards is usually regarded as rheumatism. To these first symptoms, which are common both to cases of foreign bodies in the joints, and other diseases of these parts, are some additional particular signs, by which the nature of the case is evinced.

As the extraneous bodies are in general free and movable in the joint, they can easily be made to slip about from one part of the articulation to another; a circumstance which is facilitated by the motion of their surface, as well as by the synovia, which is usually in larger quantity than natural. According to the situation which they happen to occupy, sometimes they produce some pain, sometimes no pain whatever. When they lodge in a depressed hollow they are not compressed, they cause no pain; and if they could be always kept in this position, their presence would not

say the entire loss of the motion of the knee. An example in which the patient died after the operation, in St. Bartholomew's Hospital, was the first in the collection of many others.

As the disorder is often attended with a degree of heat and tenderness in the articulation; as the danger of the operation is, in a great measure, proportioned to the subsequent inflammation; and as proof of the danger is at once removed if the incision made by the first incision, the advice to keep the patient in bed a few days before operating, to apply leeches and cold antiseptic lotions to the knee during the same time, and to exhibit beforehand a saline purgative, is highly prudent.

I shall next introduce an account of the plan of operating, as described by several of the best modern surgeons.

As these knee joints cannot always be found, no time can be found for the operation; but the patient, who will soon become familiar with his own complaint, must learn to bear with a favorable situation, and retain them there till the surgeon can see him.

"Before the operation, the knee should be extended upon a table in a horizontal position, and secured by means of assistants; the knee cartilages are to be pushed into the upper part of the joint above the patella, and then to one side; the lower side is to be protected, so that situated only the rotator internus would only be divided in the operation. Should there be several of these bodies, they must be all extended, as the operation should be postponed till some more favorable opportunity, since the leaving of one will subject the patient to the repetition of an operation not only painful but attended with some degree of danger.

"The knee joints are to be secured in the situation above mentioned by an assistant, a task not easily performed while they are cut upon, from their being loosened by the operation; and if allowed to escape into the general cavity, they may not readily, if at all, be brought back into the same situation.

"The operation consists in making an incision upon the loose capsule, which it will be best made in the situation of the thigh, as the incision will more readily be healed by the first incision. If the skin is drawn to one side gradually by making the incision, the wound through the parts underneath will not be accompanied with that pain in the skin, which circumstance will favour their union. The incision upon the capsule must be made with caution, as it will with difficulty be retained in its situation if much force is applied. The assistant is to endeavour to push the loose body through the opening, which must be made sufficiently large for that purpose; but as this cannot always be done, the incision if at any point may be passed while ago as to lift it out, or a sharp pointed instrument may be struck into it, which will fix it in its situation, and bring it more within the advantage of the operation.

"The cartilages being all extracted, the cut edges of the wound are to be brought together, and, by means of a compress of lint, not only pressed close to one another, but also in this plane underneath, in which situation they are to be secured by sticking plaster, and the rotator ligaments.

"As soon as the last incision is of the utmost consequence, this operation, to prevent an inflammation of the joint, the patient should remain in bed with the leg extended, till the wound is perfectly healed, or at least all chance of inflammation is at an end." (*Howe in Trans. for the Improvement of Med. and Chir. Knowledge, vol. 1, p. 221, &c.*)

In the instance, though proceeded in the following manner: the surgeon, after extending the capsule ligament by extending the leg, brought the extraneous body on the inside of the articulation against the attachment of the capsule ligament, and secured it in this situation between the tibiae fuge and oleum of the left hand, while an assistant drew the ligaments forwards towards the joint. The joint covering this extraneous body was not divided by any incision one inch in length, and its extraction accomplished by pushing it from above downwards, and raising it anteriorly with the end of the knife. This instrument, in extension, was fixed similar to a corner to the cartilages that cover the articular surface: it was three quarters of an inch in length, six lines and a half in

width, and three lines in thickness; its surface were smooth, one extremity the other convex; its distal extremity triangular, diversified with red points, forming small depressions; the middle was rounded, the outside of a cartilaginous texture. As soon as the substance was extracted, the assistant let go the instrument, which he had drawn forward; they immediately returned to their natural situation on the inner side of the knee joint, in such manner that the extraneous moved in the articulation was extracted upwards from the one to the capsule ligament. Two advantages were prepared by this means; on the one hand, air was prevented from penetrating into the articulation, and on the other, the flexing portion of capsule ligament, retained in place by the skin, was more likely to attach itself to the condyle, in case it did not unite to the other portion of the capsule already more reattached. The edges of the wound were brought into contact by means of the sewing machine; dry lint and compresses were applied, and pressure on the part by a tight bandage; and the limb was kept in a state of extension. (*Osborne's Journal, t. 2.*) According to Mr. Abernethy, the inner surface of the internal capsule of the os femoris presents an excavation, and is really a pitted surface, which terminates in a fringed at its upper part by a cartilaginous layer a portion of a circle. If the point of the knife be firmly pressed upon this edge so as to form a kind of line of circumscription, several thin cartilaginous bodies, they cannot pass into the joint in this direction, even if they made away with on account of the loose state of the internal articulation. Hence these substances are after the surface, which may be directly felt; and they may be exposed by simply dividing the integuments, ligament, and the capsule of the joint.

In an interesting case which Mr. Abernethy relates, the incision of the knee was greatly pressed towards the internal condyle, and the ligament of an assistant applied round the circular edge of the bone. The incisions were greatly divided towards the knee fronting, and lengthened until divided transversely over the knee substance, to the extent of an inch and a half. This withdrawing of the integuments from the natural situation was designed to prevent a direct correspondence of the external wound to that in the capsule of the joint; for when the integuments were suffered to return their natural position, the wound in them was nearer to the joint than the wound in the capsule. The flaps which covered the joint having been exposed by the division of the integuments, it was divided in a similar direction, and nearly to the same extent. The capsule is now laid bare, and gently divided to the extent of half an inch, when it covered one of the loose substances which suddenly slipped through the opening, and by pressing gently upon the flaps it was also discharged. The bodies thus removed were about three quarters of an inch in length, and half as wide in breadth. They had a highly polished surface, and were fixed like cartilage. The fluid contained in the joint was pressed towards the wound, and about two ounces of synovia were discharged. The wound of the integuments was then gently drawn towards the opening and accurately closed with sticking plaster. (*Medical Observations, 1804.*)

When there are several extraneous cartilaginous bodies in the joint operated upon, the surgeon must be careful to extract them all through the same wound, if it can be done without producing too much irritation of the capsule ligament, and they will admit of it. But frequently only one can be made to prevent itself at a time, or this be easily extracted. Each of the bodies will then require a separate operation, which is a disadvantage than disturbing the plan by one and repeated attempts to extract them all at once. (*Wegler, Trans. for Med. Chir. t. 2, p. 445.*) The surgeon is also often obliged to make his incision at a particular point, because also they can the extraneous substance be fixed. A case confirming all these facts observations was lately published by Dr. Clarke. (*Ann. Med. Chir. Trans. vol. 5, p. 87.*) In this instance the operation was three performed upon the same knee joint with perfect success. Mr. Brooke also executed five knee cartilages, by three different operations, without any subsequent synovial effusions, although the patient appears to have been previously subject to repeated attacks of synovial inflammation of the joint. (*Philos. Magaz. and Berg. Obs. p. 259.*)

On the preceding subject, some observations and two admirable appendices have been lately published by James Barry—*On the Ankyrosis of the Joints*, 2, 2, p. 421, &c. With the exception of a few wrong notions, his appendices have given a fair account of the disease.

Hydrops articuli signifies a collection of serous fluid in the capsular ligament of a joint. The knee is more subject than other joints to serous effusion, which has been known, however, to affect the wrist, ankle, and shoulder joints.—(Barry, *Treatise on the Joint*, &c. 4, p. 436.)

Mr. Barry adds the opinion that water comes of this kind from the vessels supplying the joint, but the opinion does not rest on any foundation. Hydrops articuli is not really coming from exudation, inflammation, effusion, or even fluid, the presence of excessive cartilaginous bodies in the joint, and is produced in any way which irritates the capsular ligament; such, as already explained, it is a common effect of inflammation of the synovial membrane; the capsular effluvia sometimes diffuse fibres; but in most instances it is purely a local affection, quite independent of general debility.—(Barry, 4, p. 437.)

Hydrops articuli presents itself in the joint of a soft member, determined by the distension of the capsule; increased, without change of colour in the skin; accompanied with a fluctuation; it is violent, and very little painful; causing hardly any impediment to the motion of the joint, yielding to the pressure of the finger, but not resisting any depression, as in aneurism. The swelling does not occupy equally every side of the joint, being most conspicuous where the capsular ligament is loose and superficial. In the wrist it occurs at the anterior and posterior parts of the joint, but especially in the former situation, which is more perceptible at the sides. In the ankle it is more apparent in front of the malleoli than any where else; and in the shoulder it does not surround the joint, but is almost always confined to the front of it, and can only be seen in the depression between the distal and great pectoral muscles.

In the knee joint, which is the common situation of hydrops articuli, the tumour does not occur behind the articulation; but at the front and sides. Behind, the capsular ligament is too much in the way of being much distended with the synovia; while in front and beside it is relaxed, so that it can then yield considerably in proportion to the quantity of fluid increase. The swelling is at first circumscribed by the thickening of the capsular ligament; but in consequence of the accumulation of fluid, it is uniform and extends to the thigh bone and the external malleolus of the leg, which are lifted up by it. By its tension it yields to the upper third of the thigh. The swelling is irregular in shape; it is most prominent where the capsular ligament is wide and loose, and it is in some measure divided longitudinally into two lateral portions, by the patella, the ligament of the patella, and the point of the external malleolus of the leg; all which parts the synovia rises, and pushes forwards, though in a much less degree than the capsular ligament. In these lateral portions, the internal is broader and more prominent, because the part of the capsule between the patella and edge of the internal condyle being higher than that situated between the patella and edge of the external condyle, yields in a greater degree to the distending fluid. The motion of the leg, which are generally little interrupted by this disease, make a difference in the shape and consistency of the swelling. In flexion, the tumour becomes larger, looser and weaker, and more prominent at the sides of the knee-joint, which is supported, depressed by its ligaments. In extension, the tumour is softer, and the distension smaller.

In order to feel directly the fluctuation, which is one of the best symptoms of the disease, the ends of two or three fingers should be placed on one side of the swelling, while the opposite side is to be struck with the end of the middle finger of the other hand.

The patella being pushed forwards, away from the articulation, is very movable, and, as it were, floating. When it is pushed backwards, while the leg is extended, it can be set on to a certain way. Before it meets with the resistance of the articulation, it is set on to the pressure being discontinued, it immediately separates from this part again.

By such symptoms, hydrops articuli may easily be distinguished from other diseases of the joint, from aneurism of the same system under the same symptoms of the leg; from ganglion in front of the knee-joint; from rheumatism, &c. &c.

The prognosis is most favourable when the swelling is recent and small, and has been quick in its progress like the tumour, when the tumour is of long standing and large, the effused fluid thick and firm, and the external vessels thickened, the removal of the fluid by absorption, and the restoration of the part to their natural state, will be both slow and difficult. The worst case is that which is connected with disease of the capsular ligament, cartilages, and bones.

The cure of the above-described species of affection of the joints depends upon the absorption of the effused fluid. And when the cure is considered with acute or chronic inflammation of the synovial membrane, the treatment is the same, as that already recommended for those particular cases of disease. When inflammation exists, the absorption of the fluid is sometimes altogether prevented, and it must always be promoted by friction, by rubbing the joint with clove-plaster, mercurial ointment, the use of a blister of cantharides, the very blister (intending it) of the nature of a cure. In every 100 gr. of it, and particularly by the employment of blisters.

The operation of a blister may be advantageously instead with a moderately sized blister. When after it has been made of size, two more blisters should be made, each incorporated with the first of about, electricity, and the addition of mercurial ointment. When hydrops articuli occurs chiefly to destroy the support to the joint and other forces, the operation is hardly to be expected to get well before the patient requires more degrees of strength.

As, however, hydrops articuli is generally quite a local disease, Barry contends that it should be chiefly treated with topical remedies; and he has given emulsion, salivary, hydropic, &c. as emulsion is efficient.—(Barry, vol. 4, p. 437.) He is strongly in favour of repeated blisters, both for the prevention and cure of the disease.

Craniotomies do not often justify the swelling of an opening into the joint; but excessive extension in more neglected cases, might certainly be an agreeable remedy for such an operation. Also, if the complaint should resist all other plans of treatment, and the retention of the tumour greatly impairs the strength, then, the operation would be justifiable. An interesting example of this kind is related by Mr. Latta.—(History of Surgery, vol. 2, p. 439.)

It is best to make the opening in such a way that the wound in the capsular ligament after the operation will not remain directly opposite the wound in the skin. For this purpose, the incisions are to be pushed to one side, before the incision is made.—(Encyclopædia Medico-chirurgica, vol. 4, p. 439.)

The operation is not always successful, being sometimes followed by alarming symptoms, which arise slowly and faintly, or occasion a necessity for amputation. The fluid also generally collects again, and in the synovial membrane is mostly thickened, it often diffuses, and suppuration in the joint ensues. Lastly, when hydrops articuli originates from rheumatism; when it is recent, sudden, and not large; and when it does not seriously impair the function of the joint, Barry recommends the operation, not to be done. But he maintains its performance when the disease is long, longed with excessive cartilaginous matter in the joint, or when it is very considerable, and attended with severe pain and impairment of the function of the joint.—(Op. cit. 4, p. 437.)

Collection of Blood in Joints.—More symptoms writers speak of this kind of case, though it is not uncommon. They speak of the joints, composed of blood, and set down in numerous English books as a variety of cases with the synovial ligaments, are possibly in the hands of the joint.

When blood happens to be extruded off and if a large articulation, however, no more would be gained, involving an opening for its escape. As the symptoms are likely to result from its more presence, and the absorption will, as the rest, take it away. If an incision were made into the joint, the coagulated matter

of the extravasated blood would suggest such blood to be easily discharged.

The first plan is to apply absorbent restraints; loines of flannel, spirits of wine, and masses of ammonia for the first three or four days; and afterwards, friction with camphorated liniments may be easily adopted.

Mr. Hey states a case in which the knee-joint was swollen, and blood extravasated itself into the synovial ligament; yet, though the effusion could not be ligatured, as it was emitted from the extravasation, which was absorbed without having created the synovial inflammation. (*Practical Obs. in Surgery*, p. 236.)

White Swelling.—The white swelling, or synovitis, as it is now of late often more correctly called, in inflammation of the Articular membrane, Ligaments and Articular, has been a disease indiscriminately applied to many diseases, which differ widely in their nature, causality, and treatment. Wharson was the first who used the term white swelling; and if the synovitis and the associated ligamentous inflammations of every different kind, and each kind could be found with it, because it signified every concept as one of the mark of some of these diseases, which is, not notwithstanding the increase of size in the joint, the pain is generally not inflamed, but retained its natural colour. (*Part. 1*.)

The name therefore appears objectionable only inasmuch as it has tended to suppress the introduction of a sufficient number of well founded and necessary distinctions. Synovitis, however, has previously been connected with a distinction into two kinds, viz. the chronic and acute.

The first species of the disease they also distinguished into such varieties, as primarily affect the bones, and then the ligaments and articular parts, and into various cases in which the cartilages, ligaments, and soft parts become diseased, because there is any marked affection of the bones.

Mr. Brodie has endeavored to form a more correct classification of the different complaints to which the joint white swelling is applied; and his description is so valuable, because obtained by extensive observation and accurate dissection. With respect to the disease beginning in the ligaments, if the capsular ligaments be put out of consideration, it is, in this gentleman's view, a rare occurrence, and he has never met with a case in which the fact was proved by dissection. (*Practical and Surgical Obs.* p. 7.)

1. The first case is inflammation of the synovial membrane, as described in the foregoing pages, especially that form of the disease which often arises from cold, and resembles the disease formerly often termed a rheumatic white swelling.

2. Another form of disease, not exactly comprised under the general name of white swelling, has been particularly described by Mr. Brodie: the disease originates in the synovial membrane, which loses its natural organization, and becomes covered over a thick, pale substance, of a light brown, and sometimes of a reddish brown colour, arising by white membraneous lines, and first, $\frac{1}{2}$ of an inch, or even more than six or eight in thickness. As this disease advances, it involves all the parts of which the joint is composed, producing inflammation of the cartilages, surface of the bones, and of the ligaments, and sometimes in different places. The complaint has frequently proved slow in its progress, and sometimes has remained nearly in an indolent state for many months, or even for six or ten years; but says Mr. Brodie, "I have seen, and written instances in which a red inflammation was produced, such has been known to be in which a case was effected." (*Obs. Medico-Chir. Trans.* vol. 8, p. 335, &c.) The joint in nearly the whole of the synovial membrane has always been found inflamed; though if a very early examination were made, Mr. Brodie conceives that this might not be the case; and in one example he found only a half of the membrane thus altered, while the rest was of its natural structure. (*Practical and Surg. Obs.* p. 34.) This gentleman further observes, that the preceding affection of the synovial membrane is rarely met with except in the knee; that he has never known an instance of it in the hip or shoulder; that it is peculiar to the synovial membrane of the joint; that he has never known an instance of it in any other soft part, nor even in the synovial membrane, which constitutes the knee capsule and sheath of tendons; and that it generally takes place in young persons.

above the age of puberty. In fact, Mr. Brodie has not met with more than one instance in which it occurred after the middle period of life. Mr. Hodgson, of Birmingham, it seems, has met with one example of it in the ankle; and another in one of the joints of the fingers. "In the origin of this disease, there is a slight degree of stiffness and transpiration, without pain, and producing only the most trifling inconvenience." These symptoms gradually increase; at last, the joint acquires a degree of the synovial action, the stiffness being greater than when it is the consequence of simple inflammation. The form of the swelling bears some resemblance to that in cases of inflammation of the synovial membrane, but it is less regular. The swelling is soft and elastic, and gives to the hand a sensation as if it contained fluid. Highly one would be employed in making this distinction, the absorption may be complete, and the more experienced surgeon may be led to suppose there is fluid in the joint when there is none; but, if both joints be employed one on each side, the absence of fluid is distinguished by the want of fluctuation.

The greatest experience tells us no pain until afterwards begin to form, and the swelling increases and then the pain begins to become so when the inflammation of the cartilages occurs as a primary disease, and the disease had more gradually, and undergoes a greater quantity of pain than in cases of the last description. At this period, the patient becomes affected with hectic fever, loses his flesh, and gradually sinks, unless the fluid be removed by an operation." (*Med. Chir. Trans.* vol. 5, p. 251, 252.) In the tragedy of cases, Mr. Brodie believes, that the gradual progress of the enlargement, the stiffness of the joint, without pain, and the soft elastic swelling without fluctuation, will enable the practitioner readily to distinguish this from all other diseases of the joint. However, when the disease spreads, inflammation happens to be accompanied with a quantity of fluid within and takes of considerable length, the complaint somewhat resembles in its feel and appearance that stage of gonorrhoea in the bladder of the synovial membrane, where the part is not thickened, and more or less distended with considerable fluid; but the possibility of removing the former case by the same means which cure the latter, and the agreement to the history of the disease, will prove the difference between them. (*Practical, Pathol. and Surg. Obs.* p. 36.)

3. Observation of the articular cartilages takes place in the advanced stage of several diseases of the joint, and it also takes in many instances a primary affection, in the early stage of which the bones, synovial membrane, and ligaments are in a natural state. If neglected, it ultimately occasions the entire destruction of the articulation. It may be the consequence of inflammation of the cartilage itself, or of the bony surface with which it is connected; but, as Mr. Brodie further observes, in many instances there are no evident marks of the disorder being preceded by any inflammatory action in one part or the other, and the inflammation, which afterwards takes place, appears rather to be the greatest spot, than the cause of the absorptive process. One striking peculiarity of observation of the articular cartilages is, that there occurs very little pain when the joint is in a state of pain. For the disease often proceeds so far as to cause entire loss of the bone, and yet no painful matter is found within the joint. (*Practical, and Surgical Obs.* p. 317, &c.) The investigations of the same author dispose him to believe, that a conversion of these cartilages into a soft spongy substance is a frequent though not constant consequence of absorption. (*P.* 321.) When the absorption of the cartilages shows in the superficial part, it constitutes one of the diseases which have been known by the name of white swelling. From cases which Mr. Brodie has met with, he is led to conclude, that when it takes place in the hip, it is the disease which has been variously denominated by writers, the "swelling near the hip," the "displacement of the hip," the "swelling of the hip," the "displacement of the hip," &c. At last, says Mr. Brodie, in this disease, that these names have been principally applied, though probably they implied affections that have occasionally been attended with it. (*Med. Chir. Trans.* vol. 8, p. 236.) The absorption of the articular cartilages takes place, as a primary disease, chiefly in children, or adults under the middle age. Of every eight persons of

affected with this disease, fifteen (according to Mr. Brodie) years under thirty years of age; the youngest was an infant of about twelve months; the oldest was a woman of sixty. As the knee is more frequently affected by inflammation of the synovial membrane, so the hip-joint is more liable than other joints to the invasion of the cartilaginous surface. In general the disease is confined to a single joint, but it is not very unusual in two or three joints affected in the same individual, either at the same time, or in succession. Sometimes the patient incurs the laceration of his synovium to a local injury, or to his flexor being employed in a violent way, for the most part, no cause can be assigned for the complaint."—(*Med. Chir. Trans.*, vol. 6, p. 219).

The symptoms of the disease of the hip-joint will be described in the ensuing section, and we shall here content our remarks to the synovial characterizing inflammation of the cartilages of the knee, as pointed out by Mr. Brodie. They differ from those of inflammation of the synovial membrane, by the pain being slight in the beginning, and gradually increasing very intense, which is the reverse of what happens in the latter affection. The pain in the osseous part is also unattended with any evident swelling, which seems to be less than that of two weeks, and often not illusive several months. It is very uncommon, however, that every slight pain of the joint, unaccompanied with swelling, want of motion, from laceration of the cartilages. But, says Mr. Brodie, when the pain continues to increase, and at last is very severe; when it is aggravated by the motion of the bone as in some other, and often, after a time, a slight increase of the joint takes place, we may conclude that the disease exists in both directions. The swelling arises from a slight inflammation of the cellular membrane on the outside of the joint; it has the form of the articulating ends of the bones; and for the most part it appears greater than it really is, in consequence of the vessels being wasted. No fluctuation is perceptible, as when the synovial membrane is inflamed; and is then the peculiar elasticity which exists when the synovial membrane has undergone a marked alteration of its structure.

Mr. Brodie has explained, however, that in some cases the swelling has a different shape, and even resembles the foot of a flatulentus. The progress when inflammation of the synovial membrane, attended with a collection of the synovia of the joint, or abscess in the surrounding soft parts, or in the articulation itself, were as secondary diseases. When there has been considerable destruction of the soft parts from abscess and ulceration, the head of the tibia may become detached and driven towards the knee.—(*Med. Chir. Trans.*, vol. 6, p. 225, &c.) In the first vol. of this work, Mr. Mayo has described an acute form of ulceration of the cartilages, as displayed in three cases affecting the knee, elbow, and ankle. They were all attended with severe pain in the beginning; two ended in absorption, after antiseptic treatment for two months; and the third patient, a boy, died, during the influence of this disease, of an injury of the head. The bones of the ankle-joint were found almost stripped of cartilage; what remained of this tissue was softened, and that accordingly but it seemed in other respects unchanged, and subjected firmly to the bone.

A third person's illustration of the synovial membrane, which Mr. Brodie considers in a separate section, and now proceed to the description of the swelling. In the synovial disease of the joints, the most commonly affected, is consequence of violent ulceration takes place in the cartilages covering their articulating surfaces. The membrane being ulcerated, the subsequent progress of the disease (says Mr. Brodie) is the same as when this ulceration takes place in the first instance.—(*Med. Chir. Trans.*, vol. 4, p. 265.)

By Mr. Lloyd, sometimes with swelling are displayed into three stages, the first being that in which the affection is confined to the bone; the second, that in which the cartilaginous parts become detached and wasted; and the third being that in which the osseous stage, attended with ulceration of the cartilages, inflammation of the synovial membrane, and abscess.—(*the Novels*, p. 111.) It was formerly a common notion, that in white swellings the heads of the bones were swelled enlarged. Mr. Keil, I believe,

is the first writer who expressed an opposite sentiment, and he distinctly declares, that he has never heard or known of an instance, in which the tibia was enlarged from an attack of white swelling.—(*P. 27*.) The tenacity of the opinion was somewhat pointed out by Mr. Lawrence, in the late Mr. Crookes, and the subject was mentioned in the best edition of the "First Lines of the Principles of Surgery."

Deceived by the fact of white thinned joint, and influenced by general opinion, I once supposed that there was possibly a regular expansion of the head of scrofulous bones. But, excepting an occasional enlargement, which arises from absorption of bony matter, deposited in the cavity of the tibia, tibia, and, which otherwise cannot be called an expansion of these bones; for a long time, I never met with the head of a bone enlarged, in consequence of the disease known by the name of white swelling. I was, however, much in the habit of inspecting the state of the numerous diseased joints which were every year presented at St. Bartholomew's Hospital, and though I was long attentive to this point, my attention was not really enlarged scrofulous bone always passed in review. Not more than at that period any instance of an expanded head of a scrofulous bone in Mr. Keil's museum. Within the last few years, however, a specimen of an enlargement of the upper end of the tibia has been found, and it was some time ago shown to me by Mr. Stanley. Mr. Langens is said to have in his possession a knee-joint, in which the bone and tibia are said to be expanded. The natural size of the bone not being thicker than when the tibia is of its natural size, and the vessels being, though of regular greater solidity than natural.—(*Lloyd's Novels*, p. 111.) However, that the head of the bone is enlarged does not resemble the common scrofulous affection of the heads of the bones. I say not, that Mr. Wilson, whose dissections were very numerous, contains with the best modern writers respecting the state of an osseous expansion of the extremity of the heads of the bones.—(*the Novels*, p. 111.) I have also heard of a few other instances, in which the heads of the bones were actually enlarged in cases of white swelling. However, I believe the enlargement is far from being usual, and doubts may yet be entertained whether such enlargement is connected with the osseous affection of the bone. The change which the head of the tibia undergoes in many cases is first a partial absorption of the phalange of bone throughout its surface, while at first a consequent fluid, and afterwards a yellow cheesy substance, are deposited in the cavity. In a more advanced stage, and, indeed, in that stage which most frequently takes place before a joint is amputated, the head of the bone has long since become in consequence of cancer, and its structure is more or less altered, and when an instrument is pushed against the osseous part, it easily penetrates deeply into the bone. Occasionally, as Mr. Lloyd has observed, at the base of a joint are affected in this way, but frequently only one of them.—(*the Novels*, p. 111.)

According to a modern writer, "The osseous affection appears to interfere with the bone, which becomes progressively vascular, and contains a large vessel quantity of earthy matter, which is not a consequence of that, and afterwards a yellow cheesy substance is deposited in their cavities. From the osseous bone, vessels carrying and blood, and into the cavity, which often and becomes a cyst, the cavity then beginning on that surface which is connected to the bone. As the nature of the bone of process, is destroyed in the joint. At last the osseous bone, finally, having become absorbed and dissolved."—(*the Novels*, p. 111.)

—(*the Novels*, p. 111.) The above description of the structure of the bone, this author has observed in the osseous, within the cavity of the osseous bone, it is asserted by persons who write that the osseous matter sometimes permeates the cavity of the osseous bone, and is deposited in the osseous process of the most minute size.—(*the Novels*, p. 111.) Also, with respect to the osseous matter of the diseased part of the bone, which Mr. Lloyd asserts to be the truth of this statement, as applied in the early stage of the disease, he expresses the osseous matter as afterwards being dissolved, in proportion to the quantity of osseous matter deposited in the cavity.—(*the Novels*, p. 111, 112.)

A cursory examination of a diseased joint, even when it is hot to the touch, will not suffice to show that the bones of the lower have not acquired an increased size. In making a description of this kind, in the presence of a medical friend, I found that even after the joint had been opened, the swelling had every appearance of arising from an actual expansion of the bones. The gentleman with me felt the ends of the bones after the dissection had been removed, and he coincided with me that the feet which was even very much increased seemed to be caused by a swelling of the lower three inches. But on closing them, the enlargement was demonstrated to arise entirely from a thickening of the soft parts. As known, indeed, is the experience of the hands of the lower, than the late Mr. Croxall, who paid great attention to these cases, joined Mr. Russell in believing that such a change never happened; a conclusion not entirely correct.—(*See Practical Gen. on White Swelling*, 4th ed. 2, p. 14, 1805.)

Mr. Russell has particularly noticed how much the soft parts frequently contribute to the swelling. He describes the appearance on dissection thus: "The great cause of the swelling appears to arise from an effusion of the joint exterior to the cavity of the joint, and much less from an enlargement in size, even able to have undergone a material change in structure. There is a layer than natural proportion of blood fluid intermixed with the gelatinous substance; and the delicate ligamentous stuff has become thicker, softer, and of less firm consistency, than is a state of health."—(*On the Medical Affections of the Knee*, p. 30.) The manner in which the soft parts are affected is also described by Mr. Brooke. "Inflammatory action plays in the cellular membrane external to the joint. Swollen, and somewhat congested, lymph, etc. effused; and hence, arises a puff elastic swelling in the early, and an enlargement resulting in the advanced, stage of the disease."

Scrofula attacks only those bones or portions of bones which take a spongy texture, in the extremities of the extremities, and the bones of the carpus and tarsus; and among the joints becomes affected from their contiguity to the joint which has the original seat of the disease.—(*See Medical Clipp. Yr. 1816*, vol. 4, p. 273.)

In the cavity of the joint we sometimes find a quantity of white like matter, and the cartilages absorbed in chronic places, but more particularly round the edges of the articular surfaces.

As the course of the disease implies, the skin is not at all altered in colour. According to Mr. Lloyd, the first decided symptom of disease is the stimulating fatty matter of a knee, is an occasional disordered, dull, heavy pain, unattended by swelling, and not increased by motion; and if it be the hip, knee, or ankle which is affected, the patient keeps the knee rather bent, and never fully extends it in progression.—(*On Scrofula*, p. 128.) In some instances the swelling yields to a certain degree to pressure; but it never goes, and is almost always sufficiently firm to make an undisturbed extension believe that the bones can bear the weight. It is remarked by Mr. Brooke, that while the disease is going on in the spongy structure of the bones, by far the efforts have extended to the other tissues, and while there is still no evident swelling, the patient experiences some degree of pain, which, however, is never very severe, and often it is so slight that it is scarcely noticed. After a time, varying from a few weeks to several months, the external parts begin to swell, and soon and augmented though, to be effused in the cellular membrane, so as to form a puff, elastic swelling.—(*Practical Obs.*, p. 211.) Is the quantity of scrofulous white swelling, let the skin be dried or moist, never it is perfectly transparent in one part of the joint; viz. after the course of the articulation or the head of the shaft. Sometimes the joint continues without interruption; sometimes there are attacks, and it is more tedious, the pain returns at regular times, as far as have been called by some writers periodical. Almost all authors describe the patient as suffering more or less in the advanced part, when he is warm, and particularly when he is in the exercise of his bed.

In the early stage of the disease the swelling is usually very considerable, or there is even a visible enlargement in motion, arising perhaps after exercise. In the little depressions, naturally situated on

each side of the patella, a fulness generally first shows itself, and gradually spreads all over the affected joint. According to Mr. Lloyd, however, when the soft parts on the outside of the knee-joint permanently swell, the swelling of the cartilages of the knee-joint, just behind the condyles, so that the joint appears wider; and he says, that he has often seen the swelling first commence by the swelling of a gland immediately above the inner condyle. He observes, however, that there is no point of the joint where the swelling may not begin.—(*Op.*, vol. 4, p. 128.)

The patient, unable to bear the weight of his body on the diseased joint, is consequently of the great tendency of pain then created, goes into the habit of only touching the ground with his toes, and the knee being generally kept a little bent in this manner, soon loses the capacity of being completely extended again. When white swellings have lasted a good while, the knee is almost always found in a permanent state of flexion. In scrofulous cases, the pain constantly presents any appearance of abating; but the interval between the two symptoms differs very much in different subjects.

The patient, as the disease of time, requires a violent treatment. But the interstices retain their natural colour, and remain unaffected. The enlargement, however, always seems greater than it really is, in consequence of the position of the limb both above and below the disease.

An appearance of blue distended veins, and a shining synovial, are the only alterations to be noticed in the skin covering the enlarged joint. The shining synovial seems attributable to the distention, which authorizes the external firmness and weakness of the tissue. When the joint is thus rendered the integuments cannot be pushed up, into a fold, as they could, in the state of health, and even in the beginning of the disease.

As the progress of the articulation advances, the cartilages become, and collections of matter form around the part, and at length burst. Their progress, as Mr. Brooke has stated, is slow, and when they burst, or are opened, they discharge a thin pus, with portions of a mud-like substance, floating in it. The discharge afforded becomes less copious and thicker.—(*Practical Obs.*, p. 224.) The advanced openings sometimes heal up; but such abscesses are generally followed by other collections, which pursue the same course.

In some cases, these abscesses burst a few months after the first affluence of the joint; on other occasions, several years elapse, and no appearance of this kind makes its appearance. They sometimes communicate with the cavity of the diseased joint, or lead down to diseased bone, portions of which occasionally exfoliate. In the greater part of cases, several abscesses take place in succession, some healing up, and others making its return.

As the cartilage continues to absorb, Mr. Brooke has observed, that the pain becomes aggravated, though not to a very great degree, and he says that it is not severe until an abscess has formed, and the parts over it are distended and inflamed.—(*Practical Obs.*, p. 224.)

The local mischief most commonly produces more or less constitutional disturbance. The patient's health becomes gradually impaired, he loses his appetite and natural heat and energy; his pulse is small and frequent; an obscure debilitating diathesis and profuse, morbidly even sweat. These complaints are, at first, followed by disordered, and the constitution is relaxed in time, either by the weakness or removal of the diseased part. In different patients, however, the course of the disease, and its effects upon the system, vary considerably, in relation to the rapidity with which they occur.

Extensive white swellings, or inflammation and thickening of the synovial membrane, from cold or other causes, are very distinct diseases from the scrofulous distension of the large joints. In the first, the pain is still severe to some without being attended with swelling. Scrofulous white swellings, on the other hand, are always preceded by a pain, which is particularly confined to one point of the articulation. In chronic cases, the pain is more general, and diffused over the whole joint.

Mr. Lloyd thinks, that the scrofulous white swellings may be distinguished from all other diseases of the joints, by its being attended with less pain, by its

point degree of internal swelling, often existing for a long time before manifesting in the cavity of the articulation, and by the swelling being but little diminished by any discharge of matter, which may take place. In the first stage, before the interior of the joint is affected, it may be distinguished from ordinary inflammation of the cartilages by the pain not being greatly increased by motion. The pain is increased by stretching the joint is also extensively less in this disease than in ordinary inflammation of the cartilages.—(*Read's Medical Observations*, p. 132.) And according to Mr. Brodie, the principal distinction between synovial disease of joints and the primary affection of cartilages, is the little degree of pain in the former case, which is never nearly so great as before an abscess forms, nor particularly severe, "except in a few instances, and in the most advanced stage of the disease, when a portion of abscessed bone has died, and having exfoliated, so as to be loose in the cavity of the joint, irritating the parts with which it is in contact, and thus becoming a source of constant trouble."—(*Read's Medical Observations*, p. 136.)

It seems probable, that cases in which the cancellated structure of the bone is found quite undisturbed; and in which the union of disease is confined to the soft parts, are not sufficient to give swellings. Few persons who have attained the age of five and twenty, without having had the least symptom of scrofula, ever experience after this period of life, a first attack of the white swelling of the synovial fluid. The general coherence of this observation, I believe, is universally admitted, and that there are but few exceptions to it is confirmed by the statements of Wilson, of Paris. However, Mr. Lloyd attended a man, who, at the age of between forty and fifty, died of phthisis, and had at the time a scrofulous tubercle, hidden beneath abscesses about his hip and groin. And the same practitioner met with another patient upwards of forty years of age, with a scrofulous disease.—(*De Scrofula*, p. 127.) But if these patients had had no mark of scrofula in their younger days, a scrofulous ear, specified, they then deviated from what is normal, as indeed Mr. Lloyd seems to admit. My own observations tend to concur with Mr. Brodie, that the scrofulous affection of the joints is frequent in children, are rare after the age of thirty.—(*Read's Medical Observations*, p. 136.) This observation, however, is to be received as correct, only with reference to persons who have been free from scrofula up to that period of life. I am attending at this moment (Aug. 1828), a woman who is nearly forty, and was first attacked with a scrofulous white swelling of the left knee about a year ago; but there she had enlarged glands in the neck in her youth, and a scrofulous ulcer of long duration laid open on one of her legs. All cases in which the internal structure of the heads of the bones become softened, particularly in the articulation of the cartilages and soft parts, are probably scrofulous.

Mr. Brodie has noticed the frequent enlargement of the lymphatic vessels in the joints in consequence of the latency of the disease in the bone; but he justly adds, that the secondary affection never prevents the resolution.

When the bones are diseased, the head of the shaft always suffers more than the remainder of the shaft.—(*Read's*) The outer surface of the femur sometimes has not a single rough or carious point, notwithstanding that it is diseased; this may have suffered a great deal. The cartilaginous coverings of the heads of the bones are generally eroded first at their edges; and in the bone, the cartilage of the tibia is always more affected than that covering the condyles of the femur-bone. Indeed, when white swellings have their origin in the bone, and the bone is the seat of the disorder, there is some ground for supposing that it is the thin part of the articular surface of usually first compromised.

The ligaments of the knee are occasionally so weakened or destroyed, that the tibia and fibula become more or less dislocated backwards, and drawn towards the tibial end of the femur, by the powerful action of the flexor muscles of the leg. It is observed by Mr. Brodie, and just as descriptive of the condition is sometimes followed by dislocation of the hip, to see first the dislocation of the knee occasionally take place from the other cause. When there has been considerable distension of the soft parts, in conse-

quence of attention attending to them, the head of the tibia is gradually drawn backwards by the action of the flexor muscles. And Mr. Brodie observes how this happens, previously to the formation of any abscess.—(*Read's Medical Observations*, p. 172, &c.)

I have seen a curious species of white swelling, in which the leg would be torn to pieces by a very moderate violence, both when the knee was resting and when it was in motion, a state implying a permanent laceration, or perhaps a destruction of the ligaments of the articulation.

Sometimes white swellings, as Brodie has said, are confined to a particular kind of resolution, some scrofulous or strumous kind, in which every case capable of exciting inflammation, or any morbid and variable state of a large joint, may bring on the most severe disease. On the other hand, in a more or a second condition, a similar irritation would only induce a transient, limited inflammation of the joint. In scrofulous cases, it also seems as if irritation of a joint were much more easily produced than in other constitutions: and as one can doubt that when once excited in the former state of subjects, it is much more dangerous and difficult of removal, than in other patients.

The decline of particular white swellings being scrofulous disease, is supported by many weighty reasons, the evidence of the most accurate observers, and the evidence of daily experience. Wilson (l. c. chap. 8.) calls the white swelling a species of scrofula, and adds that before and during its progress the subjects of this disease. The disorder is said by Boerhaave to be exceedingly frequent in young subjects. Petrus de Marchetti has observed both male and female subjects affected with what are called strumous diseases of the joints, as early as the age of five and twenty; but not ascertained, among them, had suffered from scrofula before that period of life, and had not been completely cured. If, however, the disease takes a similar origin. Even though a few years have elapsed since the onset of the joint, for the first time, after the age of twenty-five, this occurrence, by the first attack of scrofula after this period, may be considered as sufficiently confirmed.

Another argument in favor of the disease which sets down strumous kinds of white swellings as scrofulous, is founded on the hereditary nature of such forms of disease.

Numerous continental surgeons, particularly Hall and Wankel, have noticed how seldom the tibia and femur are both scrofulous and white swellings of the joint. We every day see that young persons affected with the present disease, are in general scrofulous constitution, or have once been so. Properly examined synovial glands in the neck denote the first possibility of scrofulous; and very often the patient are known to have diseased feet, persons who had numerous tumors.—(*Cranch's*) The disease is generally connected with enlarged lymphatic glands, or abscessed bones.—(*Read's Medical Observations*, p. 131.) All the authors observe, since the disease depends upon a scrofulous condition of the system, it is not surprising that we should sometimes find it affecting several joints at the same time, or that it should attack itself in different joints in succession, attacking a second joint after it has been cured in the first, or after the first has been relieved by amputation.—(*Read's*, p. 131.)

Besides the general condition of a scrofulous constitution, which will be noticed by the reader, I suppose, we may add others as a striking exemplification. First, scrofulous, like white of egg, blended with the most subtle such diseases as occur in the progress of the disease. This kind of matter is almost peculiar to scrofulous abscesses, and forms another description of species of the foregoing observations, relative to the disease which scrofula frequently has in the origin and nature of many white swellings.

Mr. Brodie's experience leads him to believe, that in scrofulous cases, the chance of ultimate recovery is much less, when the disease attacks the articulation of the foot and hand, than when it is confined to large articulations of a more simple structure.—(*Read's*, and *Chap.*, p. 233.)

Treatment of White Swellings.—In practice we meet with these cases, both scrofulous and non-scrofulous, in two opposite modes, sometimes the disease

joint is affected with a degree of acute inflammation, whether transient or permanent, is entirely chronic.

The impudence of patients in walking about and limping the diseased part, is often the occasion of a degree of acute inflammation, which is denoted by the tenderness of the part when touched by the fingers, and also by the symptoms feeling denser than those of the chronic form. When such state exists, there can be no doubt that topical bleeding, fomentations, diathermia, &c., or cold sensitive issues, are means which may be extremely serviceable. The inflammatory reaction is now strongly indicated. Cooling purges of the same kind should also be exhibited. Blood may be taken from the arm, and sent from the diseased part, either by means of leeches or cupping. Mr. Latta gives the preference to the latter method, whenever it can be employed; and he very properly remarks, that this advantage can be expected from topical bleeding of any kind, unless the quality of blood taken away be considerable. Ten or twelve ounces by cupping should be taken away at a time, and the operation should be repeated at proper intervals till the tenderness and heat of the skin have entirely subsided. When leeches are used, the number ought to be considerable, and Mr. Latta recommends the application of at least sixteen or twenty.—(*System of Surgery*, vol. 1, p. 463, 4).

Although inflammatory means are judicious when acute inflammation prevails, yet such preparations as are warm and morbid in the opinion of the ancients are highly censurable. While the skin is hot and tender, while the joint is affected with very acute and general pain, and while the patient is infested with the inflammatory action of inflammation, great benefit may be rationally expected from the above plan. When, however, the disease is truly chronic, different plans are indicated. In ordinary cases of chronic disease of the joint, Mr. Brodie considers topical bleeding as generally unnecessary.—(*Practical and Surgical*, vol. 1, p. 466).

It is quite tedious to expatiate on the mode of treating white swellings accompanied with acute inflammation, particularly as the treatment of those cases, which consist of inflammation of the synovial membrane has been already noticed, and may be said to be applicable to other forms of white swelling, when they are attended with heat and inflammation of the soft parts. The most eligible plan of removing the morbid process is the leech, and the most successful method of lessening the disease, independent of the joint, are the various means of promoting the action of excretion.

The works of Hippocrates, Celsus, Aetius, Rhazes, Paracelsus, &c. charged with modern surgical books, will scarcely bear us, that the practice of the ancients, in the treatment of diseased joints, does not differ much from the plan now pursued by the best modern surgeons. Mr. Crookes remarks, that the ancient and modern practice, with bleeding and stimulating applications to the skin. They further ascertain, that even produced by these means should have their discharge promoted and continued to a considerable length of time.

With regard to the case which Mr. Brodie describes as depending upon a local loss of the natural moisture of the synovial membrane, which is converted into a fatty substance, one quarter or one half of an inch in thickness, though the progress of the disease may be somewhat checked by rest and cold lotions, it is according to this gentleman's remarks, and at length it comes to a crisis of the cartilage, abscess, &c. Why there is considerable pain in consequence of the cartilage beginning to decay, partly relief may be derived from sedatives and potasses; but nothing will effect a cure. When, when the joint begins to suffer, as considers absorption and suppuration.—(*Med. Clin. Trans.*, p. 254). Whether the use of effluvia applications could be beneficial in the early stage of this form of disease, is a question that deserves further investigation, but this only be determined by careful observation.

When white swellings are accompanied with chronic disease of the cartilage, all modes of the joint is extremely painful. Indeed, as Mr. Brodie well observes, feeling the limb is a state of perfect numbness, a very agreeable state the most exquisite sensibility,

to be appended to in the movement. According to this gentleman, it is in this disease, in which alteration of the cartilage occurs as a primary disease, that ankylosis is most readily produced of singular benefit; but he observes that of late time in any other disease of the joint. He thinks sedatives and warm, kept open with various means, may also be used with advantage. Bleeding is indicated only when there is frequent recurrence, the irregular motions are increased, and there is pain and fever. Mr. Brodie asserts that the worst kind of ankylosis is the early stage, if it does not stop the progress of the disease, but he considers patients of great dissipation, extravagance, intemperance, and intemperance, as either useless or harmful.—(*Med. Clin. Trans.*, vol. 1, p. 330-334).

Topical applications, consisting of strong solutions of the mineral and vegetable kingdom, are of no service in destruction of vibration of the cartilage, or of the synovial form of the disease, though they often suffice in the cure of some mild descriptions of white swelling, depending upon a thickening of the synovial membrane. A doctrine of our last, consisting of ankylosis, was promulgated by Mr. Russell.

My own experience will not allow me to say any thing in favour of electricity, as an application for the relief of white swelling; and it must be more likely to do harm than good, whenever the indication is to loosen the joint.

"If the tumour is quite indolent (says Richardson), the application of galvanism may be proposed; it is not, however, except from danger, and on our occasion when I employed it, stimulating pains and swelling of the joint were brought on by it."—(*Nervous*, Clin. 1, 3, p. 124, 2).

Mr. J. Brodie had experience in chronic white swelling as possessing power over every chronic disease, and that such diseases of the joint are often naturally benefited by the patient's going to the sea-side and bathing, is a fact which cannot be denied. Whatever may be the mode of explaining the benefit thus obtained, I fully believe that sea air and sea bathing have a beneficial influence over chronic diseases of the joint; but probably their effects are confined to the part through the medium of the constitution, and they should only be recommended as an auxiliary plan, to be adopted in conjunction with other well chosen medicinal treatment.

Every one is well acquainted with the efficacy of friction in exciting the action of the absorbents. To this principle we are to apply the great benefit which arises from what is termed dry rubbing, in cases of white swellings. This kind of friction is performed by the naked hands of an attendant, without any ankylosis than any kind of friction is either application whatsoever, ankylosis sometimes a little heat, or powdered starch, and the rubbing is continued seven or eight times a day. At first, many joint patients used to turn their head round by drawing themselves in this species of labour, in which they were paid a stipend of six pence per hour. This practice, however, is chiefly advantageous in the chronic stage of white swelling, aiding first inflammation of the synovial membrane.

I look upon all ankylosis as a disease, such as inflammation and suppuration, or acute disease of real efficacy, except when first pain or active inflammation is present, and, though they were in some cases, the patient, they ought not to be encouraged. Thus, except when, only, it is to be used to relieve the patient's fever, without doing any real good to him in regard to his affection, may be considered as doing harm, because the suppuration of swelling being done, the patient is under great trouble and pain from being moved. The French surgeons are particularly liberal in the joints which they remove on white swelling, ankylosis, suppuration, &c., and they consider instances of white swellings being cured in this manner. But the cases to which they refer were by no means ankylosis, and, according to the synovial swellings; a disease which is peculiarly ready to yield to other plans.

The only method of treatment which my own personal experience enables me to recommend for white swelling is a chronic state, requires in keeping up a discharge from the surface of the diseased joint. The operations which I have had of ankylosis the effects of having had chronic ankylosis, (this is not my intention, as given the same to the same).

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*Treatment for Blighted Infants, and the New-born of
Lancaster*: 12mo. Lond. 1868.

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(JUGUM TESTIS). A continuous large cavity the posterior end of an incision doubling the value in permeability as capable to retain the fluid in the bladder. A jagged, strongly speaking, jagged incision that operates by sucking up the part of the urethra. A jugum of the kind, which was illustrated by Nark, is described in Hirst's Surgery—(See tab. 30 fig. 8 & 9). And a large incision is likely to take place a jagged incision on this principle is not applicable, and indeed is necessary to create pain, and is not found to succeed. Donald's incision for rendering a stricture simple, noticed in the article CURE. Incontinence of a still lower age was proposed by Lee Hanks—Jones, de Vol. Clin. et Pharmacol. 1. 10 p. 101. Wherein even the left side is possible, and a permanent to be given. An apparatus for securing the urethra directly it escapes from the stricture, in the incision. A few minutes of such assistance may be found in Jurell's Treatise on Gynaecology. The instrument consists of three pieces; viz. 1. A very small, a small tube of elastic glass, and a silver flask is inserted into the place of the incision, a small hole, which gives rise to the water. The (very small) is made and about 10 days is sufficient. In an external edge there are several small holes, through which the liquid is passed, which causes it to be the best. The small surface is highly engraved, so that it may adjust itself perfectly to the particular shape. The small surface is rather convex, and formed with a continuous double perforation in several places, to which the elastic very neck or tube is fastened. The lower part must be four or five (seven, ten, and with enough to hold the penis, as desired, and is made to work on to the lower half. At the upper part of the opposite three pieces, which form each other is a straight arm, and serve for fixing a sponge with the urethra. The silver flask is four inches wide, and of a flat shape: is like on the inside of the neck, or in a pocket made in the branches. If necessary, a larger flask may be used. According to Mr. Mackenzie, of Glasgow, a Swedish kind of the penis in the stricture answers very well in stricture, some after laboratory.—(See fig.)

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place its lateral and posterior surface in the horizontal position. The latter is what the German engineers particularly imply by the phrase *Induktion*.—*See* *Induction*.

KNEE, DISEASES AND INJURIES OF THE.—
See *Dislocations*; *Fractures*; *Gonorrhea*; *Wounds*,
Amput., &c.

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self-defense is now frequently attacked with vehemence and vigor, more than the club itself. According to Professor New York in the *Register*, N. Y. 343, this vigorous indignation of the laymen should be very rare, and he desires that, in the course of a practice of twenty years, he has very seldom met with one. On this point he differs

the tendency to contract the folds, out, and on, organic structure that instead of these folds, or that of performing the motions, as played by Woodhouse, it would be better to endeavor to restore the natural mode by removing the obstructions in the nasal duct, which obstructs Pott regarded as the cause of the disease. The method consisted in opening the lachrymal sac with a small trocar, introducing through the nostril, sac, and making a probe down into the duct, and then using bougies for the dilatation of the passage. This method may be said to be the model of that which has been most extensively followed, even down to the present time. Pott and Warton (before mentioned) the introduction of a spiral tube down the ducts directly, and leaving it for a time to this position, with a view of preventing the duct from closing again; and the use of a cannula becomes now preferred by Traquair, the greatest success of France.

The danger of leaving any substance of the sac has influenced many practitioners besides Aert, and given rise to various ingenious contrivances. Thus, in 1770, the William Elliot proposed, instead of inserting bougies to introduce squabbles through a small puncture, communicating with a long tube full of this fluid. The specific gravity of the squabbles when the eye was diseased with it, he supposed would force them down the lachrymal duct through any stricture, to remove the lachrymal obstruction.

The late Dr. Ware, attempting to restore Pott's plan, gave the substance of Aert's syringe, with which he generally injected warm water, through the same position, lachrymal into the lachrymal sac, and put a finger over the superior punctum to prevent the fluid from escaping through it. With his finger he also occasionally compressed the lachrymal sac, in order to assist in propelling the water down into the duct. The squabbles used this injection water a day, except in general warm baths frequently. — See *Ware on the Eye*, p. 41.

His general plan the treatment by injecting water warm every second the inferior punctum, lachrymal, and I repeat the injection about five days or sometimes, if, in this space of time, none of the water goes through the duct into the eye, and if the watering of the eye continues as troublesome as it was before the injection was employed, I usually use the angular vein, or draw a blood to be applied over the lachrymal sac: adding here a caution, that the blood be not pulled to it, or either of the eyelids, but to pass over an obstruction of blood in the angular vein. About the same time, that blood is taken away in the neighborhood of the eye, I usually rub the injection, and try the effects after a week, or, at the most, two weeks. In some instances, also, when I have found it impossible, after several attempts, to inject any part of the fluid through the duct, I have introduced a golden probe, about the size of a lachrymal, through the superior punctum lachrymal, and, according to the direction of the duct, have introduced its extremity through the choroid, and, conveyed it fully over the same, immediately after which I have found, that a fluid, injected through the inferior punctum, has passed without any difficulty — and by repeating these operations for a few successive days, I have at length established the freedom of the passage, and discharged the eye. In other instances, I have occasionally a success, immediately afterwards to be considered as the case, about a year before the time of the patient's death, which, as before, I effected a high discharge from the lachrymal punctum, but, when, there also, every method to open the duct has failed in the long run.

A Conjunctival Yarn, which may not be relieved by any of the means above related. — (Ware's *Observations on the Eye*, p. 41.)

When conjunctival yarn has been used, Mr. Ware sometimes found, that a serious injury happened to the eye, quickly corrected by means of the probe.

In a subsequent 1783, Dr. Ware observing, that if, after a short time, in ten days, there be not some perceptible advance towards a cure, or, if, after the long continuance of the obstruction, there be reason to fear that it is too firmly fixed to yield to this long mode of treatment, I do not hesitate to propose the operation which is now to be described. The only persons who should be subject to this operation are those who, in the frequency of this complaint are labored. In such persons I

always think, it advisable to propose the operation, unless the symptoms be particularly urgent, and they are either or very great.

If the disease has not terminated in a stricture in the lachrymal sac, or if this stricture be not situated in a right line with the longitudinal direction of the duct, it is possible about to make into the eye, at a great distance from the internal junction of the probe, and, seeing as with a wire, immediately from this junction towards the nose, with a very narrow open pointed lance. The first end of a silver probe, of a size rather smaller than the probe that we commonly used as a syringe, should then be introduced through the second, and gently, but steadily, be pushed on to the direction of the duct, with a force sufficient to overcome the resistance in the duct, and until there is reason to believe that it has freely entered into the cavity of the duct. The position of the probe, when first introduced, will be nearly perpendicular, and will limit the upper edge of the duct; and the space between its bulbous end in the eye, and the second in the duct, usually be small, in which the probe moves, as to about an inch and a quarter, or an inch and three quarters. The probe then to be withdrawn, and a silver style of a size, slightly smaller than that of the probe, but rather smaller, about an inch and three quarters in length, than the last, the end of a nail, left placed slightly, that it may not enter the eye, when it is introduced through the duct in a right line of the probe, and, to be left constantly in it. For the first day or two after, the eye has been introduced, it is sometimes advisable to rub the eye with a weak astringent lotion, in order to relieve any swelling or inflammation, which may have been excited by the operation; but this is general advice, and should have rarely been applied to use any application is required. The style should be withdrawn every day for about a week, and afterwards every second or third day. Some writers have recommended that the style be inserted through the duct into the eye, and the instrument be afterwards replaced in the same position as before. I strongly advise to move the end of the style with a piece of dry cotton, plaster spread on black silk, but without touching the necessity for applying any remedy by blackening the head of the style with wax or resin.

Mr. Ware did not, as first trying this method, expect any relief till the style was left off. However, he found, that the watering of the eye ceased, so long as the style was introduced, and the sight became proportionally more useful and strong.

The wound, which Mr. Ware made in the eye, when there is no regular stricture, appears, is only just large enough to admit the end of the probe or style; and has even become a healing ulcer, though when the style only is passed without the least pain or distress, is about a week or ten days, the wound becomes so dry, that the patient, or his friend, is fully competent to do what is necessary. It rarely occurs in withdrawing the style that at times there is a weak, occasionally increasing, more warm humor, and then re-joining the instrument as before.

Since, finding no inconvenience from the style, and being able to leave it off, over it, for years, some others advise it to stand a month or six weeks, are otherwise quite well. The operation sometimes failing over the lachrymal sac, commonly lead to no more use than the probe down into the eye; and Mr. Ware sometimes has instances, in which the style has been left a week or more of the lachrymal duct, and has been afterwards removed. — See *Ware on the Eye*, p. 41.

Next to the impossibility of the lachrymal probe, and, if, by Mr. Ware, Dr. Traquair is strongly disposed to think, in which, lachrymal probe has been used, and finding the style remains in the passage. When, at intervals over the eye has been closed, the difficulty indicated the introduction of a style like the ducts easily, immediately after the introduction of the duct with a lachrymal. — If the probe passes without meeting into the eye, the case requires no further operative treatment, the lachrymal probe, to healthy condition, and in the next application, the ducts gradually distributed, and the lachrymal duct. If, on the other hand, after communication with the probe, introduced through the wound into the eye, resistance is offered in its passage into the eye, no more favorable opportunity will be presented, for

great advantages would be gained by the use of this instrument: one, of exhibiting invariably the lateral incision of Chamberlain; the other, of constantly guiding the patient, through the whole course of the operation, from injury of the ureters, and of the urethra, from injury of the prostate. The utility of the latter object being frequently disputed, as it is evident that the necessity of the direction of the instrument depends on the extent of the injury, and that its cutting edge and being inclined to constantly traverse the ureters and sinuses of the bladder, and to follow upwards in the direction of the longitudinal axis of the neck of the urethra, cannot avoid the great injury. But with respect to the first advantage, or that of extending constantly the lateral incision of Chamberlain, it is to be admitted that it does not completely fulfil the intention which he proposed, not only on account of the cutting edge of his instrument not being placed exactly above the level of the sling, to penetrate sufficiently the substance of the prostate gland, and consequently to divide it to a proper depth; but likewise, being too much turned upwards of that point, so as to lay open the base of the prostate gland, it does not divide it liberally, but rather at its upper part, towards the summit of the ramus of the bladder, and the neck of the prostate, its opening of all others in the perineum the least complete, and presenting the greatest impediment to the passage of the urine from the bladder.—See also *Key to Lithotomy*, p. 183. The breadth of the point of the director is, besides, so disproportionate to the diameter of the membranous part of the urethra, that, from the great resistance with which it meets, the instrument may easily slip from the groove of the staff, and pass between the bladder and rectum, a serious accident, which has very often happened even in the hands of experienced surgeons.

Scarpa considered the modifications of Chamberlain's point proposed by R. Bell, Denon, Cline, and Crusk, as a depreciation of the original instrument. R. Bell (the observer) has distinguished the breadth of the director, but given the cutting edge a horizontal direction. The horizontal direction of the cutting edge is also preferred by Denon, Cline, and Crusk; but they have enlarged the director and transverse part which, from necessary reasons. Aware of the danger of widening the point entry by the horizontal direction of the point, they direct the handle of the staff to be inclined towards the patient's right groin, and the point to be pushed along it, instead of which a mistake that its oblique edge may be directed towards the rectum, and the cutting edge placed at a sufficient distance from the urethra, and hence of the patient to avoid wounding the artery. Scarpa considers, however, that it is difficult to direct a proper degree of obliquity to the staff, and that such limitation of the instrument must be hypothetical, arbitrary, and unstable, in comparison with that position of it in which the handle of the staff is held in a line parallel with the body of the patient, and is accurately placed against the arch of the pubis; on the instability of the instrument. (See Scarpa's) the safety and precision of the lateral operation depend. According to this opinion, and position, the defects of Chamberlain's original point arise from the excessive breadth of the director, consequently at the point the mere of sufficient elevation of the cutting edge above the level of the groove of the staff, and the inevitable inclination of the edge to the axis of the urethra and prostate gland. The review of the mistakes in a cross between thirty and forty years of the lateral operation, done in the hands of the apex of the prostate gland, first shows its tendency and how some of the failures of Chamberlain. The apex of the prostate gland is rather more than two lines in thickness, the body or middle part, and the base six and sometimes eight, which exceeds the radius of the bladder. In an adult of middle stature, from sixteen to twenty years of age, the thickness of the base of the prostate gland is about two lines less, increased but that of a man of forty, and of a large size. The prostate lies in which any patient previous of the prostate gland should be made in a white (very large), is found to be inclined to the longitudinal axis of the neck of the urethra, and of the gland itself, at an angle of 45°. From these facts, it is seen that the structure of the parts, Scarpa makes the direction of the point very thin, too small and too short; the breadth decreasing at the base. The cutting edge of the instrument is

straight even to point, but gradually rises, and becomes convex above the level of the staff, so that the point enters it to a considerable extent. Lastly, the inclination of the cutting edge to the longitudinal axis is not at right angles at all, but at 45°, and in some, the angle is the full angle of the prostate gland to the longitudinal axis of the neck of the urethra.—See Scarpa's *Almanac on Medicine's Gargel*, 1799, p. 12, 13.

For more than twenty years this instrument was used in London, has been in the habit of being a point which Mr. Abernethy invented, and which is in the peculiarity of its cutting edge turned up as an acute 60°, leaves much room in the instrument itself, as is pointed by Scarpa. The cutting edge is straight, and that incision and dangerous part of a proper, somewhat round the shoulder, is removed. Adverting to the principles of the lateral operation, as explained by Scarpa, we observe, and of which I shall presently speak, it appears to me that Mr. Abernethy's point is the preferable to that very recently proposed by Scarpa. Its edge is not an indefinitely turned up, but it is even with more care, and less risk of slipping from the staff, because it has not any projecting shoulder, which, while the staff is firmly held, holds the back of the point in it, and causes the other effect, by this abstracting the passage of the fluid instrument.

Grooves which cut on both sides have also been sometimes employed in England, and as a point having can be obtained by them, even without touching the base of the prostate gland by Scarpa, that is, without cutting any part of the body of the bladder, they appear to present utility, especially when of which is suspected to be large. However, they can be used now than they were, some years ago, when Dr. Andrew Cooper employed them in Guy's Hospital, and I am acquainted with the personal reasons of Scarpa.

In the United States, when the subject is said, that of Dr. Physick is preferred, it being easier of entering a much better edge over the point. Dr. Cooper has improved the point of Dr. Physick by inserting the blade so as to taper from the main part of the cutting edge to the handle of the instrument. From this point, to be seen in Cooper's *First Lect.* p. 268, and 2, 3, 4. It has been found that the blade was too broad, and that they rendered no return when the point had been called the prostate gland, as the position between the patient and the bladder. Such has been only since then, and now it is the history of the point.—(See *Physick's* 6th of the *Medical Repository*—*Review*.)

Some criticisms on Scarpa's method of operation, and a few remarks on the size and position of the lateral incision, will be found in a subsequent chapter of the present article.

Mr. A. Cooper, as I think with considerable reason, recommends putting the patient on his side, and has a little while previous to the operation. His objection of operating when the kidneys are distended, the staff is obstructed, and hence in the most, unless a very irregularity of the prostate gland, the law found the operation generally more successful in the post and labouring classes, than in the rich and sedentary. Old age is not considered by him as an objection to the operation, which he even believed had succeeded in persons from sixty to eighty years of age. If the patient is loaded with fat, he says he thinks of peritoneal adhesion is always great. Adhesions to the peritoneum, or to the bladder, or to the rectum, are frequent after operations on the bladder, particularly where a large blood has been cut.—See *Cooper's* 2d, p. 114, 115. When a mass of coagulated blood is accompanied by an enlarged prostate, the patient the day or two recovers from the operation.—(See *Cooper's* 2d, p. 262.)

As inflammation of the bladder and prostatic is the principal danger of this operation, and, even in a high degree of injury and violence, is most likely to happen in a phlegmatic subject, it has been thought whether a patient should not be put on a diet of some kind of the patient is operated upon, supposing the first age and weakness from prostaticitis. The diet, however, which prevails in the recovery, is a mixture of 100 parts of whey, and a great deal of food is recommended in the operation itself. A vegetable diet is a diet of two below the operation, and is a failure.

When, however, the loss of blood in the operation has been considerable, the patient is passing unduly, and particularly when the operation has been tedious, and the bladder has suffered a good deal, I am disposed to think very desirably of the use of bleeding, the patient as soon as he is out of bed, and recovered from the first depressing effects of the operation. An opening venous should be given as early before the patient is out, and a *clyster* injected a couple of hours before the operation, in order to empty the intestines, and thus diminish the chance of its being necessary.

It is generally considered unreasonable to let the scabbler be somewhat financially, and the patient is frequently directed to retain his wife a certain time before being let. Formerly, a patient paid for some three days for feeding his wife in the blender; but very few enter into the procedure, I have never heard of any contraindications being employed. The presence of urine in the bladder, it is conceived, may lessen the chance of the faeces of that organ being injured by the process; but as the level of this extravasate should always be in the groove of the ureter, I do not care that the cause for the practice is good. The plan is disapproved of by Dr A. Cooper, who says, that when the urine collected passes out, the scabbler urinates, and studies the stone is clearly that it is difficult to get hold of the foreign body with the fingers.—*See Lancet*, vol. V, p. 347.

Before the specimens, the following instruments should all be arranged ready to use: a staff of as large a diameter as will easily admit of introduction, and the giving of weight is very deep, and closed in the extremity. A sharp probe, with a thick stock and extremely adapted to the deep grooves of the preceding instrument, so as to slide easily and securely. A large scalpel for cutting the first incision. Forceps of various sizes and forms for extracting the stones. A steel-pointed native bistoury for enlarging the wound in the prostate, if the incision of the gland be not sufficiently large, and the parts should never be incised. A pair of Lee's forceps with teeth for breaking the stone if the handle come through any wound remains closed. A syringe for washing out clots of blood or particles of old stone; a speculum, however, not considered necessary by Mr. A. Cooper (Lancet, vol. 2, p. 367); a string for the extraction of small calculi or fragments. Two strong parties or hands, with which the patient's limbs and feet are tied together.

The structure of the staff is a matter of considerable importance, because the efficiency of the machine through the protein gland and neck of the Machine is partly determined by it. The French engineers, notwithstanding the advantage of introducing the thought in the direction of the axis of the Machine, always use a staff which is much more curved than that English engineers employ.—See *Revue d'usage fait & leçons de 1914, on l'industrie de la Côte d'Azur*, (p. 225). But I am inclined to agree with Stampa, that the Machine is best to let the curvature of the staff correspond exactly to that of the jaw of the work of the Machine and protein gland.—(*Quintessence of Copyright*, Vol. I, p. 224.)

After investigating the site, and seeing just the state of security in the building, the police is to be alerted so the entry point is secured as the person of the building is not wanted.

A young man, looking up at the ceiling with his left arm, is with his right arm, the staff, holding in his hands a number of small items, as if he were the owner of a collection of objects. He is looking at the left side of the picture, and his right arm is raised, the hand to the top of the frame, as if he were holding the handle of a sword. The picture is a black and white photograph, and the man is wearing a dark jacket and a light-colored shirt. The background is a plain, light-colored wall.

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of the environment on safety and pressure of the labor operation demand.

For A. Tinsley directs the operator to hold the staff perpendicularity, and to let it point on the stone, as he has seen many farmers to which the gospel has entered the bushes, owing to the staff not having been placed into it, but rested against the prostate gland.—(See 2nd vol. p. 230.)

The first incision should always commence below the arch of the nostrils, over the membranous part of the alar cartil. at the point where the opening denotes to make the first cut into the groove of the staff, and the cartilaginoid extend in horizontal order, obliquely downwards to the tip of the nose of the patient, at an equal distance from the symmetry of the nostrils to the same. The first cut should proceed rather beyond the level of the centre of the nose; for it is a general rule in surgery to make free internal incisions, by which the progress is enabled to conduct the remaining steps of incision with greater facility, and now here it is necessary to make a second to be levelled off.—*Letter 5.* This excellent surgical writer, Cullen, also draws in a rule to be observed in the internal operation, that the incision ought not to extend to such parts as can make an impediment to the contraction of the skin; and, therefore (p. 69), he says, and that part of the nostril which is surrounded by the nasal apophysis, should never be cut. Only those parts ought to be divided, which freely resist the safe introduction of instruments into the bladder, and the extension of the stone. Hence, the lacrymatory must be opened by an simple incision, and the membranous part of the artery, tracheal, perist. muscle, levator ani, and prostate gland be properly divided.—*Synopsis Chirurgia Medica, p. 2, p. 655.* Like Scarpa, however, he is mistaken in making a free cut through the neck of the bladder, and, in lieu of doing so, prefers a slow and cautious dissection of the parts. When the external cut through the urethra, &c. and membranous gland, muscle has been made, the next object is to divide the transverse perist. muscle, which stands, 600° a line, across the transperist. bulbo, all of which above the stone can be easily extracted. A part of the membranous portion of the urethra, adjoining the prostate gland, is best to be laid open, but an extension through it, as far forwards as the bulb, is quite unnecessary, because it will not at all facilitate the removal of the stone with less

Placing the head of the patient in the groove of the stand, the operator takes hold of the latter instrumentality with his left hand, raises as lightly as possible the abdomen, so that it may form nearly a right angle with the body, and stands up. Before attempting to push the patient into the bladder, however, he should slide it backwards and forwards, with a wringing motion, that he may find, by trial, its best position being in the groove of the stand. The left hand forwards of the hands of the other, with pressure as to elevate it, being, while introducing the organ into the bladder, is also backward of great importance, for it is by this means that the organ is introduced along the groove of the stand in the axis of the bladder, the only direction unopposed with risk of rupturing the ducts. In fact, the organ should be introduced freely with freedom corresponding to a free return from the position to the rest. It is obvious, however, that the degree to which the uterus is lifted upwards is depressed and disposed very much upon the curvature of the instrument.

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The basis of the bladder, and they are something of which magnitude, that the bladder appears as if it were divided into two or more cavities of nearly equal dimensions found in those several cavities, and the bladder has been mentioned. When this happens, a portion of such frequent production is often observed with an ovary; a circumstance that has deceived some practitioners, and led them to suppose that the cancer actually adhered to the coat of the bladder—*See Linnæus's Cæca Catalogue deinde vol. V. p. 265, 267.*

The collection of crystals shows various different modes of penetrating into those which themselves retained. Little observed, that they might be removed in two ways. When they could only be removed by the operation into the bladder, he recommended the (and) extraction of stone, with which the operation entering the calculus was to be taken, a finger being put into the urethra in order to keep it from being removed by the action of the stone in opening the cyst. When the case is more complicated, Little recommended the removal of stone with a small or medium sized instrument that remains the urethra in position, with the stone and supporting upon the outside of the bladder of the instrument. The external hand pressure would then destroy the internal pressure of the cyst, and that the stone would pass into the bladder, and subject of being easily extracted. As Robert observes, the plan that was used, which is founded on this idea, published by Little of the present treatment, is more easily supported, is easily learned, and is positive.

Garrigue indicated in his history that the bladder for the purpose of destroying a calculus, based on a systematic view of the freedom of this organ, beyond the pelvis. The lithic and stone (the bladder) would be the greatest part of the length, and that instrument would be inserted into the pelvis, where the stone was placed, as it is as it could reach. The pelvis was not more than 10 or 12 inches long, and consequently if a man could reach the urethra, the stone was lowered and taken out, and the child remained. However, as Robert remarks, there are many instances in which this mode of proceeding cannot be followed; for, if the calculus is situated in a curved situation, as often happens, the calculus of which is narrower than its body, and the stone itself considerable size, the calculus cannot be made large enough, without run of falling through the whole thickness of the bladder, and producing certain death by the violence of urine in the bladder.

Other practitioners, backed that the calculus might be taken out of with the forceps, and held about in different directions as to locate in the pelvis, or even that it might be finally removed, without any serious ill consequences. Robert remarks (*see Med. de l'Acad. de Chir. t. 2, p. 267, &c. vol. 126*), that Pagnon advised this method on a patient, thirty-five years of age. The calculus did not reach long, and its surface was found covered with fleshy substance, which obliged the collector to the bladder. The operation was painful, followed by considerable hemorrhage, and the body, however, not removed, and died.

There are some examples, however, in which the lithic practice had been various. In 1736, Le Denon extracted two or three in successive years, adhered to that part of the bladder which lies upon the pelvis. The insertion of the instrument of the stone first produced some pain in the bladder, and then as months, which increased in size until the substance of the instrument only. The stone was finally pushed, and the instrument then away with the calculus. Ten days afterward, some three times the stone was removed. The calculus was removed in Le Denon's Treatise on the Operation.

Le Denon observed, supported small stones, which adhered by a thin fibrous surface; and the stone as happened after M. Hildart, was in 1712, removed, with a pair of forceps, a stone which was a calculus, and having no other part connected to it. In 1713, the patient of one called in Le Denon to remove it, it was found in the extremity of the urethra. Le Denon is sometimes why a pair of forceps, and finally it fell into the bladder, where it was removed without difficulty. It included a considerable stone, and its large surface had been helped in the stone, from which it could only be gradually removed.

Robert to term that a case of this description which seems to be very uncommon, is the only one in which there is any prospect of removing an irregular stone with success. In other examples, he conceives that it is more prudent to leave the stone and let the bladder heal, than to try the patient when blood remains in the bladder, and attempts to extract it—*(Lithotomy, t. 2, p. 220, 224, &c. 2)*. Deauville employed a sort of covered stile, called a *style-à-cave*, for opening the cavity of cyst; and he has recorded an example, in which he thus successfully extracted from a woman, aged sixty-two, a stone lodged at the entrance of the urethra into the bladder. The instrument, used by Deauville, Deauville did not consider a safe instrument in the cases of stone, and the stone was separated from the bladder, an objection in which he says the *style-à-cave* is not liable. No injury can be derived from its use, as the blade is concealed, and can only pass to the point where the stone is lodged. If the incision should not be completed at first, the blade may be withdrawn, the remarkable nature of the instrument pointed into the urethra, and the incision proceeded in any extent. This instrument was directed to the extreme purpose of dividing the bladder into the urethra, but it was afterward employed with the greatest success for the removal of diseased vessels, and from a variety of causes. The blade is as inserted into the urethra, passes through the urethra, and is then drawn into the urethra, which may be divided, a stone that could be removed with the stone or bladder, and the stone could be removed, and the stone is removed without difficulty. *See Robert's Lithotomy, t. 2, p. 224, &c.*

Dr A. Cooper remarks, that when the stone is partly in the cyst and partly in the bladder, it may sometimes be removed without opening the bladder. In this case of a child, he passed his finger into the urethra, and felt the stone, which was a large stone. He then raised the urethra, and it struck the stone, and the stone was removed. When the stone was in the urethra, the stone was removed through the urethra above the lower, the cyst was opened, and the stone taken out, without any further opening of the bladder itself—*(See Robert, t. 2, p. 246.)*

A stone perfectly encysted would not be expected to produce symptoms equal in severity to those which arise from an extraneous body actually in the cavity of the bladder, and generally they do not have this effect; yet, in Hunter's interesting dissertation, several cases are recorded, which prove that encysted stones do sometimes cause the same distressing symptoms which would arise from the presence of a loose calculus in the bladder. Hence, the patients were treated, and in consequence of the stone or position in which the stone lay, the urethra being closed, the calculus was directly struck by the instrument, and lithotomy attempted. It deserves particular remark, also, that in a large proportion of these cases, the pusules or cysts were not single, but numerous, occupying different parts of the bladder. In some instances, referred to by Hunter, cysts of this kind were found not containing any stone whatever; a circumstance that would rather lead one to suspect that, in many, the collection of these cysts precedes that of the calculus, and not the other. (*See Hunter's Dissertation on the Stone, in the Bladder, in Med. de l'Acad. de Chir. t. 2, p. 265, &c. vol. 126*).

OF SOME PARTICULAR METHODS AND EXPERIMENTS

M. Pagnon, an eminent surgeon at Paris, observed and is related a plan of his own, which, however, has not been considered by others as worthy of being introduced. The patient having retained the stone in the bladder, he passed the instrument into the urethra, and passed the instrument a little below the stone, it was a stone, that by pushing the bladder upwards, he may make that part of it protrude into the urethra between the rock and the stone. The operation, of his own hand, introduced the force of the left hand upon the urethra, and drawing it down towards the urethra, pushed it a distance of an inch or two of the urethra, and the great tuberosity of the urethra, and about an inch above the stone. Then the stone is to be carried up parallel to the urethra, exactly between the urethra and the stone, and the stone is to be pushed into the bladder, on one side of the rock. As soon as the bladder is wounded, the operator withdraws his fore finger from the urethra.

perhaps, of Egypt, whose individual skin is said by Linschbach to stand superior to the disadvantages of this method, on account of having the patients for the most with a degree of stoicism still equal to that of the almost insensated operation. The extraordinary success which characterized Cheselden's practice, we have already noticed. The success of the successful operations done by Poye Jacques and others are equally remarkable.

Mr. Matthews, as I have noticed, lost but two patients out of 48 in whom he operated, and this without making any incision, as he never expected any cure. His patients were always kept a week in the hospital, they were operated upon, and this operation, with a required diet, and perhaps a course or two of supporting medicine was the only postoperative treatment. — (*Med. Chir. Trans.* vol. II, p. 595.)

During my stay in Paris, in 1814, I saw Dr. Stankiewicz correct a stone of considerable size on the plan of his well known assistant. The incision was simple and direct, so that the calculus was taken out with perfect ease. Now, as the operation of this professed lithotomist was very successful, and he expects the operation of scarcely ever losing a patient, are we not justified in inferring, that the advantages for a well opening are preponderating the most injury which can be offered to the practitioner? My own observations certainly lead to such a conclusion, as will be presently explained. The truth lately established by Scarpa (*Memorie on the Cutting Surgery of Menstruation*, &c.), by Rivolta's late for its male organs, the irreversibility of a modification of Stankiewicz's concept, and the localization of the prostatic gland in making a limited incision in the prostatic gland without cutting any part of the bladder. An incision does cause there to be sustained for the extraction of even a stone of moderate size, he is the advocate for the gradual dilatation of the urethra and orifice of the bladder. He comes, that the liberal operation, though associated with the greatest success, does not extend the duration of life in a certain degree the orifice of the bladder and orifice of the urethra, the dilatation of these parts, however moderate, being always necessary even when the calculus is of middling size. He states that in the adult the orifice of the bladder dilates almost spontaneously in the diameter of the stone, and he adds, that the internal incision, within proper limits, divides the body and base of the prostate gland to the depth of five or at best six lines, forming with the urethra, to which the orifice of the bladder externally yields, an aperture of six lines. He, says Scarpa, in an adult, a stone of ordinary size and well figure is removed from the internal diameter, to which incision he added the incision of the bladder of the prostatic capsule, even after the incision has been made with the most skilful assistance, the stone, though of moderate size, cannot pass out of the bladder, unless the dilatation of the base of the gland and orifice of the bladder be carried to the extent of nearly eight lines beyond the tip of the prostatic neck with the knife. But, says Scarpa, if in order to avoid dividing the point to the extent of eight lines, the base of the prostatic gland, together with the orifice of the bladder and a part of its fundus be divided to a depth sufficient to it, the stone would advantageously be removed by a direct incision into the bladder, between the os urethrae and bladder, and consequently suprapubic, perineal, female, and other various cuts. — (P. 4, 5.)

According to Rivolta, the spot of the prostatic gland forms the greatest resistance to the introduction of the instrument the extraction of the stone, and therefore ought to be carefully divided (p. 7); but he comments that this and considers these lines of the substance of the base of the gland should be left undivided, which, he asserts, is a matter of great importance, because the immediate portion toward the orifice of the bladder, connects the effluents of urine, and the circulation of lymph, or blood, between that part and the urethra. — (P. 22.)

After this statement of one of the great principles which regulate the success of the lithotomy, the performance of the operation is described by the two authors as follows: — As we think it probable, that the plan of making a direct incision into the bladder might be abandoned. How far larger (that is) the method which has answered so well in the hands of Cheselden and the several instrument lithotomists already noticed.

And must we believe that the stone damaged since this plan by Hemmard, Denard, Mr. Lane, and others, the best modern surgeons in this country, is divided very easily a supposition particularly in the use of cutting instruments?

Formerly as I present the manner of a Calver and Scarpa, their authority cannot influence me, because I find it outside with the details of operations—the great exhibition of every talented man is justice.

We have seen, that an apprehension of effusion in urine, prostatic, female, &c. is the only reason assigned by Scarpa for his abstinence in making a direct division of the base of the prostatic gland on either of the bladder. But I would inquire, does he find extraordinary of the stone broken in the prostatic gland, and prostatic, and hence, in Scarpa's own language, in England, as to make it possible that these lithotomists can ever proceed from common mode of dividing completely, not only the stone of the prostatic gland, but also the adjoining part of the bladder? Are such bad effects uniformly experienced in the country, or is continuous a material source of inconvenience in the mind of a surgeon about in symptoms too many? Do they form a valid reason for modifying the practice of always commencing an lithotomy with a direct incision, to make an incision in the prostatic gland, the only removal of the calculus? And would not Scarpa's method of dividing and dilating the urethra, in order to get the stone out of the bladder, which dangerously prolongs any operation, and is unaccompanied from the repeated use of the bougie, great urethral extension, and laceration of the bladder, and perhaps very likely to follow?

I have seen the lateral operation performed as the operation of Scarpa, with such various kinds of success, limited knives, the lithotome, &c. &c. in various respects. In all these attempts, the great intention of the surgeon was to make a direct opening into the bladder. I do not mean, however, to say, that the operation was always accomplished, even the use of the instrument employed, and sometimes, sometimes frustrated the view of the operator. But what was the consequence? Generally speaking, those surgeons who made only a small incision into the bladder, and kept their patients lying upon the operating table, on this principle, as getting out the stone, by the repeated use of the bougie, but the lithotomists on the contrary, after their patients recover, a large portion of time being carried off by periclitosis, on the third or fourth day after the operation.

On the contrary, when the incision was large and direct, so that the calculus could be easily and easily removed, the patients were almost always cured.

For the first six or seven years of the last century, for which I suggest frequent applications of many lithotomists performed in St. Bartholomew's Hospital, patients were invariably cured, some of which had no incision made. The consequence is, that the operation of the patients were divided a ring with the bougie, operating table before the stone could be extracted, and some considerable mistakes were not infrequently made. Afterwards, however, in the last century, common scalps and hooked knives were presented, and a free opening was usually made, and the proportion of deaths from periclitosis and other accidents decreased.

The following observation, made by Mr. Matthews in the month of particularly attention: — "In the five years of my practice," says he, "I was not once cured; and often in forming many thousands of patients, in myself and others, which appeared to me from the use of the cutting force, I did not find in it that instrument aside, and neither the force only, and the direct incision, or a conductor for the stone." — (*Med. Chir. Trans.* p. 665.)

Now, when we remember that this gentleman lost only two out of eighty-four patients on whom he operated, the comparative of great experience, and the cases and the other facts which I have mentioned already impressing upon the mind of all that have urged respecting the advantages of making a direct incision, and in the best direction for the very purpose of the stone onwards.

In Mr. Matthews's manner of operating, is a

he does not make the external wound parallel to that in the bladder, as I venture to recommend, but draws it nearly in a line with the paper; a circumstance which may, perhaps, account for his continuing the use of the linen garter as a pessary for the leucorrhoea. Neither is his indirect incision drawn downwards and outwards, as DeMeade, Deauville, and many other judicious surgeons would most advantageously. That these defects in Dr. May's process to cut there and are rendered of less consequence by the rule which Mr. May himself observes, of making his first incision long and deep, and spreading all stretching and laceration of the parts. Like Engelstedt, he sets a staff, the growth of which is much more and longer than usual, and therefore more easily felt. This instrument has small and holes, as the very preferred by Sharp, nearly as well as spiral straight grooves. "After the first incision says Mr. Marshall, I look at the staff is now placed in its situation, and then feeling for the groove, I insert at the point of the staff 1820 it, so that when I draw it out, and cut the membranous part of the urethra, continuing my finger through the prostatic into the bladder; when, beyond enlarging the wound downwards, and enlarging the cavity, I turn the edge of the blade towards the division, and make a slight enlargement of the wound in withdrawing the blade." (*New Med. Lib. Trans.*, vol. II, p. 400). This description is particularly interesting, as coming from a person who also was a French surgeon, and surgeon.

With respect to the degree of importance which ought to be attached to the Star of Redemption of virtue, between the United and invited, progress, design, and I can only say, that they are inconceivable, which are not commonly observed after humanity in this country. In fact, on three occasions only, I have known the thing come through the wind longer than, more, and there have been great results. As for the extraordinary of virtue and strength, I have mostly regarded, and although they cannot be a doubt of their occasional occurrence, they have not taken place after any of the numerous operations, with the results of which I have been so acquainted.

All these facts and considerations, therefore, incline me to doubt whether the apprehension of the offense of crime, *in toto*, etc., is sufficiently serious and well founded to make it a sufficient for purposes in vindication for the plan of avoiding a complete abolition of the sale of the prostitute plant and back of the industry, in the opinion of philosophy. Nor is it as effective to say, "well, the effect of crime and slaying are likely to be the effect in practice is free practice. Indeed, wherever they do happen, I believe they proceed from a totally different cause, etc. from the influence on the skin being too small and too high up, and from the skin being an important part of the infection, not corresponding with the kind of the criminal mind. Hence the crime does not really turn out very extensive, and some of it goes into the neighborhood of other criminals."

En conséquence de la théorie précédente, l'équilibre stable du système de deux masses est obtenu pour une valeur de α qui dépend de la position relative des masses. On peut alors se demander si ce résultat est en accord avec les observations. On a vu que les observations indiquent que les masses se déplacent vers le centre de gravité. Or, si l'on considère le cas où les masses sont très éloignées l'une de l'autre, on trouve que α est très petit, ce qui correspond à une position stable proche du centre de gravité. À l'inverse, si les masses sont très proches, α est très grand, ce qui correspond à une position stable proche des masses. Ces résultats sont donc en accord avec les observations.

No doubt it is one of the most important things I have ever done. It has been a great experience and I am proud to have been able to help so many people.

The first thing I did was to go to the hospital and see the doctor. He told me that I had a very serious condition and that I would need to stay in bed for several weeks. This was a shock to me, as I had always been healthy and active. But I knew I had to do what the doctor said, or my life could be in danger.

I stayed in the hospital for about two weeks. During this time, I met some other patients who were also recovering from surgery. They were very helpful and gave me a lot of advice. I learned that it was important to eat well, get plenty of rest, and take my medicine as prescribed. I also learned that it was okay to ask for help if I needed it.

After I was discharged, I went home and followed the same advice. I ate healthy food, got plenty of sleep, and took my medicine every day. I also made sure to keep my wounds clean and dry. After about four weeks, I was feeling much better and was able to start doing some light exercise.

I am now completely recovered and am back to my normal self. I am grateful to the doctors and nurses at the hospital for their care and support. I am also grateful to my family and friends for their love and encouragement throughout the whole process.

If you are ever in a similar situation, please don't be afraid to ask for help. You will get through it, and you will be stronger than before.

—*John Doe*

I regret that the observations published by me, in the *Archiv für Naturgeschichte der Medicin*, should not have secured to him a fair measure of the same.

And that he should have deemed it necessary to declare my criticism of his anatomy being too small, and inadequate to the powers of any but children under the misleading name, is another fault.—(*Opusculi de Chirurgia*, vol. I, p. 32.) He supposes that Chiracius, Pierre Jacques, and others, in their successful operations, made the largest kind of incision which he himself is commended, and did not cut the bladder inside; a position this does not appear to me correct. He assumes, and after the risk of the prostate gland is divided, the exterior of the bladder is capable of yielding so as to allow the stone to pass out without danger, if this part of the operation be done slowly and gradually; and he supposes his doctrine on this point to be confirmed by the analogy with regard to the cañon of the female bladder is killed by the extraction of calamus of comarication, &c. a case hardly possessing an analogy; for, because there is no inward grade or bulver, and certainly, because anatomy itself, it is wrong, it is a safe common-sense, compared with what it is in man. The hypothesis of dividing the exterior of the female bladder, however, he thinks acknowledged in another part of his writings, and is analogous to the ground of dividing prostatic of the prostate.—(*See Opusculi*, vol. I, p. 103.) It does not appear to me that Scarpa's proper case is the division of the prostate in a direction corresponding to that of ductal parts. This view, he thinks, is not founded on correct principles, and he maintains that his incision in the prostate does correspond to the ureter, instead, because, when the bladder is empty, the prostate is naturally placed in a line sloping thus from the neck of the pines to the vertex, and with its posterior surface resting on the rectum, as is represented in *Chirurgia*, *Dissectio*, *Scarpa*, *Publi*, 18, 2, tab. 2, fig. 2. This explanation is not satisfactory in itself; but I have good grounds in recommending it, as it also appears to Scarpa to amount to a variation of my observation, and his proper does not make a division of the prostatic portion of the urethra in a direction corresponding to the axis of the neck of the external parts.—(*Opusculi de Chirurgia*, vol. I, p. 32.)

ATTENTION THROUGH THE MEDIUM

This meeting may be said to have been first suggested in a work published at Pisa, in the 16th century, by an author who assumed the name of Vegetius:—"Quod per artem possit material, et vivas arces lapides etiam," says Vegetius, in speaking of this matter. (1560, Chap. viii, p. 302). That the proposal never received much attention until the year 1816, when M. Simon, in France, gave an account of this manner of operating, and urged several considerations in its favor. In that country, however, the operation has been performed only by Dupuy and Deshayes, and though the electrical mode by the latter proved successful, the same French surgeons did not appear to have imitated him. Deshayes himself has also now given up the practice. About as soon as this meeting first found of on the other side of the Alps, it was put to the test of experience by Haskins, in a case where every other plan of operating appeared totally inoperative.

In the course of the further dissection, the stomach, pyloric gland, and posterior part of the bladder (see Fig. 1, 2, 3, 4), while the rostral portion, just by dividing the ligaments and the lower part of the stomach and the rest of the penis, I should expose not only the apex of the prostate gland, but a more or less considerable portion of the body, and that I should then be able to penetrate into the cavity of the bladder, either at the neck through the prostatic, or at its imperforate part. It was the latter method which M. Simon first tried upon the dead subject. The body was placed in the position usually chosen for the caesarean section, and, as usual, was introduced and held perpendicularly by an assistant. A lumbar, with its blade kept flat on the iliac vessels, was now introduced into the incision, and the edge being turned upwards, M. Simon, with one stroke, in the direction of the incision, cut the sphincter and, with the knife part of the incision. The bottom of the prostate gland being thus exposed, the finger traversed passed beyond its solid substance, where the staff was readily perceptible through the thin pelvis of the ureters and bladder. While the latter pelvis was steadily maintained in its original position, M. Simon now introduced the knife into the bladder, and, following the course of the staff, made the incision along its edge in depth. At this moment

reports are becoming increasingly indispensable. Of recent patients, operated upon with division of the flexors of the bladder neck, Prosser-Smith, East with two, with a sub-cervical fistula, and the fifth was in danger of life. In four cases operated upon, Prosser-Smith knew of three with termination. Excellent cases have been treated by the method of which I have increased the size by 100% without any after-treatment to be taken into the account, that of some patients the food and urinary tracts, after sewing, to be used for some time, but would again.—(See Taylor and Greenish, p. 45.) In the second is typical Surgery at Yonkers, one of four operated upon, through the rectum, three died, although others, after subsequent to the initial try at an inverted in a short time.—But was last patient with cystitis, which were treated in a second of the second. Discharge, which the first was a question in its treatment, performed by Yonkers, one third of its patients of inflammation within six weeks. The first patient died a fortnight after the operation, and two on the third day. The third was treated with various agents, through which one case with cystitis, which, or was partially applied upon the bladder contraction.—(See J. Louis, Paris, *Revue de la Médecine*, Paris, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456,

LITERATURE IN WORKS

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left of this fact, they would be immediately removed by other legislation, especially those contained in the papers published by Sir A. Cooper.—*See also the Times, vol. 8, col. 21.*

The constitution speaks in the language of very large catches through the means of justice, but President de Larosière to deliver the advice not to interfere with them, as he thought they would all eventually assist in the recovery of the fish in the ocean. (The President of the United States, with the advice of the President of the United States, has been advised to deliver the advice not to interfere with them, as he thought they would all eventually assist in the recovery of the fish in the ocean.) (The President of the United States, with the advice of the President of the United States, has been advised to deliver the advice not to interfere with them, as he thought they would all eventually assist in the recovery of the fish in the ocean.)

When participants began to identify what they very rarely did themselves as spontaneously violent, and the legitimate and defensible nature of the female victims they suspected that it would be a good practice to distinguish patients by pathological characteristics, kept it would allow the note to be extracted, and that not all occasions for making instruments might be suspected. Within this view, I felt first proposed suddenly dilating the patient with two good instruments, called a sub and female needles, between which the fingers or forceps were present for the removal of the cranium. ("Threats to Life and Limb," *Paris*, 1891.) But as it was deemed highly proper, that the difference would produce less suffering and injury, it was gradually cleared, because suggested the promise of dilating the uterus with the instrument of John Keeney.

Mr. Broun published the case of a young girl, in which he referred the necessary diagnosis by microscope, and the necessary treatment, the appendixes, each of a great interest in a collateral sense, that there being it will serve, by reason of a symposium, such a fitting in 1912 for the construction of instruments on the principles of Mr. Arnold's design. The physical part was devoted to diagnosis in proportion to the various cases reported, and in a few hours, the diagnosis was so far advanced, that the calculus had to be put out. — See *Chir. Obs. and Cases*, vol. 2, p. 178.

Mr. Thomas met with a case in which, after drying the incision vertically with a sponge wet, he succeeded in inserting an encephalic which lay across the neck of the bladder. The prostate was so much enlarged that the left ureter-ligament was necessarily introduced, and gave this impression: "I believe had the case required it, both the right and left ureters would have passed into the bladder without the slightest difficulty." After adhering to his method for three days, proving the case well, watching the female ureters can be dilated, Mr. Thomas remarks: "If these ureters can be dilated, and there is no reason why they should not, I can truthfully claim any case in a young and healthy female subject, and where the bladder is free from disease, where a very large stone may not be extracted, without the use of any other instrument than the Syringe, the catheter having first been carefully dilated by means of the sponge ureter. For this purpose, the blades of the female ureter can be stretched and strong in those commonly considered." (*Am. Med. Jour. Trans. vol. 1, p. 123-124*) Many facts of a similar kind are on record, and one, in which a large urethra case was successful, is referred to in a modern periodical work—see *Quarterly Journal of Foreign Med.* vol. 2, p. 201.

These steps are later collected into the final bladder in the following manner: the pattern being being placed in the position previously adopted in the final operation, a suitable staff, with a blow cord, is introduced into the bladder through the acetabular incision. The surgeon then passes about five grooves of the instrument the bulk of a blunt probe, which instrument becoming widely expanded the bladder, which is a part of the urinary filtration. The staff being withdrawn, and the handle of the probe being held with the left hand, the right forceps, with the nail curved downwards, is now introduced slightly above the convexity of the instrument. When the bladder and neck of the bladder have thus been fully empty, the finger is withdrawn, and a small part of the probe passed into the bladder. The probe is now reversed, and the index taken hold of and exposed. (Salvetti. *Medicina Practica*, 1. 1. 100.)

This plan, however, has been subjected to no scrutiny at all, the diagnosis being no carefully effected; and the results of treatment, considered the factors involved.

through its centre. The expanding property of the sponge, in its contracting vert, will make the necessary degree of compression of the vessel, whilst less now deeply to be torn. Lastly, as with cold water, should at the same time be applied to the perineum and hypogastric region.

I cannot say that it has failed in my lot to see any cases (out of the four number which I have seen) in which death could be ascribed to lithotomy, notwithstanding the bleeding has often been so profuse, and that so deep a wound, just after the operation, as to create surprise that it proceeded from the arterial circulation. Each haemorrhage generally stopped before the patient was put to bed.

[The lithotomy instrument was used by Dr. Poyark, after he being wounded at Lithuania, nearly 30 years since.—*Edin.*]

The history of patients who die after lithotomy, perhaps peritoneal inflammation. Hence, on certain occasions of tenderness near the lithotomy topus tenderness should be put in practice. At the same time, still or less motion should be applied to the hypogastric region. The belly should be supported, and the female kept open with the dress (1818). The tenderness of the pain, should not deter the practitioners from doing the latter. This approach is only difficult, and generally conducted with inflammation which the abdomen. It is a curious fact, that Dr. Martinson, who has only two out of 18 patients who he operated upon for the stone, should never have noted it repeatedly; but it appears to me, that it is a weekly better argument in favour of the superior utility of operating with the knife and making a free opening, than a remedy for disgusting observation, when the inflammation has commenced, which, however, may not be the practitioner's meaning, as he says, "I believe it will be used in adults, that death follows either from exhaustion, after a tedious operation, or from desquamation, &c. thus often wrote the same" (*Med. Cas. Trans.* vol. II, p. 46); a sentiment which I can say, this gentleman would not have sustained had he been present with me at the opening of the many unfortunate cases which had formerly occurred in the practice with highly skilled practice in St. Bartholomew's Hospital. Together with the above symptoms, the vomit, both, a distention of the lower part of the abdomen, and frequent distress, are highly proper. I have seen several old subjects die of the infection of a diseased thickened bladder, continuing after the stone was extracted. They had an acute urinary symptoms, the inflammatory fever, the general tenderness and tenderness of the abdomen, as in cases of peritonitis; but they refused every assistance in the lower part of the pelvis; and instead of dying in the course of three or four days, as these usually do who perish of peritoneal inflammation, they, for the most part, lived from two or three weeks after the operation. In these cases, urine dysuria, and increasing the dysuria. On this point, are the best measures. In cases of rupture of the kind, diseases have about the neck of the bladder.

[The following communication on this subject is from Professor Zimmerman of Ratisbona. As it contains a brief notice of the comparative results of lithotomy and the liberal operation, and suggests many practical hints deduced from his extensive experience, I have been unwilling to curtail it, although it lengthens the limits applied to me by the publishers; but have therefore concluded to insert it, with the view that the points of difference between him and his predecessors in practice may be fully stated in the next number. It will be found to possess a simplicity and elegance, which will make it acceptable to young men, especially since these observations are by written sound in the description of the operation by external means. Having witnessed a number of Dr. J.N. operations when I resided in Ratisbona, I have been both surprised and pleased at his successful efforts in producing "stone in the first instance" in various wounds, as well as that in other operations. The procedure of the day have needed many of his valuable communications to the department of surgical knowledge, in some of which poverty will stand in the way of originality.]

It may be recollect, that in Europe there the reports from France respecting the operation of lithotomy, in the hands of M. Civrie, took in the year

1804-5, some of the most exaggerated eulogiums of America attempted its performance; in all which attempts there were complete failures: and the wealthy with which this operation was success by operating surgeons remain within the sphere of their action; on the contrary, most of the highly respectable medical journals of this country record in the words each other which was sufficient to the need of power for having first resounded the important necessity associated with this operation.

And now we always have been to, investigators every thing wearing the appearance of improvement, and influenced as we always have been by feelings of humanity to all mankind, we did not lose any time in extending our inquiries into the history, character, and results of the operation of lithotomy. Our investigations resulted in a publication in the *Medical Records of Philadelphia*, in which we endeavored to show the impossibility of the new operation, under so many circumstances, as to merit the satisfaction, that the advantages of lithotomy were greatly overrated; and would never, in a general rule of practice, supersede the liberal operation. Even that time in the present, we have understood, free from prejudice, to keep pace with the practical improvements in lithotomy, and we are compelled to say that we have seen nothing calculated to change former opinions.

One thing we think will be conceded on all hands: that lithotomy will never do away the necessity for the liberal operation. And as it has been our duty to differ with a large proportion of the profession, respecting the merits of the new operation, we have it also been our lot to differ, essentially with all authorities which have come within our observation, as to the plan of operation, both in the male and female patient.

The limits assigned us will not admit of our investigating this subject in detail, nor of entering generally and the merits or demerits of the several operations; we shall therefore proceed to offer our own experience, and leave the reader to appreciate as to his may show proper. We will only say further, that it is but justice to write for posterity; and, aware as we are of the passing character, which has so much been without science from its dawn, we cannot disposed, lightly, to place ourselves in the list of such specialists.

Believing as we do, that we have materially improved the operation of lithotomy in both sexes, we purpose laying our views before the public: we will as briefly as possible describe our method. In doing this, we may have occasion to notice some facts connected with the history of this operation.

We need not go far back into the records of surgery, to see the processes adopted by generations of healing wounds by the free incision. This applies more particularly to surgical wounds. Among the greater operations, lithotomy was the first to claim attention, in respect to solving this, and then followed the cure of clamps; next, we notice similar attempts to expedite the cure of wounds made in the supposition of the female patient: then attention was called to a similar plan of procedure in wounds, surgical or other, of the skull; we now find important method of healing by the first incision performed in the treatment of wounds generally that seemed eminently to admit of it; but by some strange fatality, it so happened that we saw thought of applying this ordinary practice in the worst mode in operating for the stone; till it fell to us to test this method, and to realize before our eyes, most disastrous consequences.

We have been in the habit of performing this operation, after the most method, for six or seven years; and our success has been such as to make us extremely desirous to acquire the preference with our plan, and combine it with two or three cases, by way of illustration our method of procedure, and of depicting the impossibility of that method.

So far as we recollect, the history attributes to surgery advice free external incision, and only the purpose of gaining easy access to the bladder, but not with a view of advancing a free cavity for the stone, which is expected to force through the neck. We are directed by many to carry out incision as free and a half posterior to the anus, or down to the tuber ischi.

We are decidedly of the opinion that this procedure is attended with several disadvantages, and affects

characterized by the ease with which the abscess discharges itself with a dense purulent issue; and though it generally soon makes its way to the surface, it also is sometimes absorbed.

The best lumbar abscesses make it a common mistake to open five or six abscesses. In the latter case the abscess breaks with great velocity to the surface of the back, where suppuration allows it to escape spontaneously; after which, the case generally goes on better than if it had been opened by art. But in chronic abscesses, the matter has not that strong tendency to make its way outward; its quantity is continually increasing; the cyst is, of course, incessantly growing larger and larger; in short, the matter, from one cause, slowly gradually increases in the quantity of a gallon. When the abscess is at length opened, it bursts by suppuration, the surface of the open inflames; and its great extent in this circumstance, is enough to account for the terrible constitutional disorder and fatal consequences, which too frequently must follow the evacuation of the contents of such abscesses. Hence, in cases of chronic suppuration of every kind, and not mostly in lumbar abscesses, it is the surgeon's duty to observe the opposite rule to that applicable to acute cases; and he is called upon to open the collection of matter, as soon as he is aware of its existence, and the situation will allow it to be done.

This view of the principle on which the treatment of a lumbar abscess should be conducted, is not, however, adopted by all surgeons. Keiliasse believed, that the patient had the best chance of recovery, when the abscess was allowed to burst spontaneously, and the matter to be gradually discharged through a small opening. (Keiliasse's Medical Surgery, vol. 2, p. 299; and Mr. Pearson, in comparing the results of his own experience, declares them to be in favor of the above practice. The generality of suppurative abscesses in this country, differ on this point from Keiliasse and Pearson; yet, while they advocate the utility of an early puncture, they admit the danger of suddenly discharging the contents of the abscess through a large one, which is afterward left unclosed.

Certainly, it would be highly advantageous to have more records of ascertaining whether the cysts are diseased; for, as in this instance the matter does not keep up suppuration until their surface had cured, and there would be no reasonable hope of curing the abscess sooner, it might be better to avoid puncturing it under such circumstances. The possibility of this conduct seems the more tedious to assume, which are too strong more likely to stop and enhance the disease of the spine; and also such as afford the best chance of bringing about the absorption of the abscess itself. However, if the suppuration cannot be prevented from discharging itself, and suppuration is at hand, it is best to meet the danger, make an opening with the lancet in a place at some distance from where the pus is the most, and afterward heal it in the way which will be generally dictated.

Though we have proved the practice of opening all chronic abscesses to be wrong, the deep situation of the lumbar one, and the degree of doubt, always insinuating its view, still unfortunately prevent us from making the somewhat step at the present time. But still the principle is equally practicable, and should step us to open the tumor as soon as the formation of the abscess is distinct, and the nature of the case is evident. For this purpose, Mr. Abernethy employs an abscess lancet, which will make an opening large enough for the discharge of those fully matured pus frequently found mixed with the matter of lumbar abscesses, and by some conceived to be an abscess of the disease being suppuration. If the abscess seems to consist of a part of the coagulable matter of the blood, and not very grossly separated by the peculiar cysts of pyothous abscesses. The puncture must also be of a certain size, in order to allow the exit of blood, occasionally acted with the action to escape. Mr. Abernethy considers the opening of a lumbar abscess a very difficult operation. Punctures should be made large enough to open the abscess, but not so large as to leave the wound open; the total consequence of which was, great irritation and inflammation of the cyst, increased suppuration of the discharges, infection of the contents of the abscess in consequence of the pressure of the blood being, and the effect of the whole such practice prevented very few abscesses with

lumbar abscesses were sufficiently strong to escape. The same reasoning applies pointed from opening the abscess to contain the matter suppuration, and then burst by suppuration. If then a more happy mode of escape depend upon the abscess in which lumbar abscesses are punctured, the operation is contrary to a rule of great utility.

Until the collection is opened, or burst, the patient's health is usually stable or not at all improved. Indeed, we see in the face of many patients with lumbar abscesses a list is usually understood by the patient in health. Chronic lumbar abscesses are professional evidence is to be avoided, when great change for the better, and even death, occur very soon after we have let out the matter, steadily, and only, in consequence of the operation. Every plan, therefore, it is worth to make, to prevent these alarming effects, is worth to make, to make, and such a measure, is the practice, recommended by Mr. Abernethy.

Two punctures is needed to let out the matter, and such the wound immediately followed by the first puncture. He justly considers all instruments of gold, and other instruments, which only make an edge of the puncture, and make the opening to grow together again. The wound is to be constantly closed with a rubber plate, and it will always remain open.

These punctures do not give a double the extent of matter within the cavity of the abscess. It causes a fresh suppuration take place; but it is obvious, that the matter, as fast as it is pushed, will gravitate to the lowest part of the cyst, and consequently the upper part will remain for some time undischarged, and have an opportunity of coming out.

When a chronic quantity of matter has again accumulated, and pressure itself is the pain, or suppuration, which is to be removed. Straight after the first puncture, the abscess is to be punctured again in the same position as before, and the wound healed in the same way. The quantity of matter will not be found much less, than what was at first discharged. Thus the abscess is to be repeatedly punctured in succession, and the wounds as regularly closed by the first lancet, by which method irritation and suppuration of the cyst will not be induced, the cyst in the cyst will never be allowed to become diseased, and it will be rendered smaller and smaller, till the cure is complete.

In a few instances, the worst case, perhaps, is to be made to preserve or finish the repeated punctures which it may be necessary to make; but still according to our view, the cyst is a solid body, and sufficient opportunity to connect so much, that to seal the wound may be of alarming extent. It is also a fact, that the cyst does not invariably become more indurated and less suppurative after the treatment here been once or twice practiced in the above way. He disposition to absorb lumbar abscesses.

The knowledge of the fact, that the cysts of all abscesses are the same, should lead us to see as frequent other means, which Mr. Abernethy employs, as likely to promote the dispersion of the abscess, by quickening the action of the abscess. It is not kept open with saline issues, but, especially, sometimes roasts of the subject of pus, as the matter will coagulate in this object. When the vertebrae are injured, there are likely to be cured.

In the rapid consolidation the tumor always occurs. If an opening is made in the abscess, the cyst is at first more likely to be irritated than when the tumor are not diseased, and the surface of the cyst is rendered much less likely to undergo any improvement, in consequence of the very formation of an organized exudation. The same will effect of local suppuration, to which case, the absorption of abscess here is always retarded by the presence of organized matter and case, which feed down to the bone.

Mr. Abernethy succeeded in curing some lumbar abscesses without opening them. Large incisions applied to the integuments covering the abscess, and kept open with the abscess lancet, effected the cure. When the punctures produced great collection of matter, he used a small lance, which he introduced in the same place as often as necessary. He observed that the patient was not allowed to rest in any other way, but to keep after using a small lance. I cannot, however, discover any reason, for his practice in relation to the abscess here, except that he was obliged

malaise, nervousness, fever, and malaise. The inflammation of the breast sometimes assumes a suppurative character, sometimes they are only met in particular places. The inflammation may affect the mammary gland itself, or be limited to the skin and surrounding cellular substance. In the latter case, the inflamed part is equally acute, but when the glandular structure of the breast is also affected, the enlargement is irregular, and seems to consist of two or more large tumours, situated in the substance of the part. The pain often extends to the axillary glands. The secretion of the milk is not always suppressed, when the inflammation is limited to the (epithelium), and any portion is said to pass on more quickly than in the affection of the mammary gland itself. When the symptoms of inflammation continue to increase for two or three days, suppuration may be expected; unless the progress of the inflammation be slow, and the degree moderate, in which circumstances suppuration may often be avoided, even as late as a fortnight after the first attack. When inflammation of the breast is generally attended with more or less epigastric pain, anorexia, &c.—(See Form.) According to the valuable description lately given of disease by Sir Ashley Cooper, it is observed in the first stage, suppurative in the second, and abscessive in the third. Swelling is followed by a loss of inflammation upon the surface of the breast, and discharging very "pale" milk. "A particular phenomenon and sometimes an observed at the part of the breast, with a sense of fluctuation beneath the power of matter. The constitution also highly excited, which is excited by the violence of the swelling, accompanied by heat and profuse perspiration. Over the most prominent part of the swelling, the cellular sequences, dermides follows in the case, and the matter becomes disengaged through the aperture thus produced."—(Illustrations of Diseases of the Breast, p. 2.)

When suppuration takes in mammary abscesses, within the first three months after parturition; but they may also reach beyond the disorder or long as they continue to work.

The most common cause of mammary abscess, as accounted by writers in general, are, rejecting the secretion of milk at an early period; mental disturbance, fright, &c. exposure to cold; moving the arms too much while the breasts are large and engorged; bruise, and other external injuries. The causes are all of a suppurative kind. In Sir Ashley Cooper's opinion, the principal cause of acute inflammation and suppuration of the breast, is "the rush of blood, which flows freely such time the child is applied to the breast, and which by nature is called the discharge, and is the preparatory step to the secretion of milk." He also refers to the frequent exposure of the breasts by sitting, and the active exertions of the child in suckling, as promoting the origin of the complaint. This view, he says, often produces these abscesses immediately after the giving on, by not putting the child soon enough to the breast, and by giving them other strong stimuli.—(See Illustrations of Diseases of the Breast, p. 2.)

The matter is sometimes contained in one cyst or cavity; sometimes in several; but the abscess generally breaks into the nipple.

As the inflammation of the mammae are attended with considerable suppuration, there they should be carefully distinguished from what we call a milk abscess.—(See Form.) It is said that sometimes the pressure of the mamma, which have existed a long while, often diminishes when the discharge of a milk abscess. Women who have been long pregnant are sometimes affected with suppuration in the breast, supposed by Sir James to be connected with abortion or miscarriage shortly after they are able to discharge the breast.

In the early period of the affection, suppuration should be attempted. The following are the principal means for this purpose:—(See Form.) The first, is to keep the inflamed breast from being disturbed; resting the arm in a sling; sometimes keeping the milk tenderly rubbed out of proper intervals;—careless application, consisting spirit of wine or liniment of the discharge of effluvia. "If the patient suffers from the cold produced by the evacuation of the milk, a flannel fold pressed may be substituted for it, occasionally applying leeches, and still no effecting that the blood depends

upon temper purging."—(See Dr. Cooper's Illustrations of Diseases of the Breast, p. 3.)

When matter cannot be prevented from forming, an incision is made in a good application, or the surgeon may apply "incisions of paper, lint, and poultices made with milk and sweet almond oil, mixed with brandy," which last should be renewed three or four times a day. In order to lessen the patient's suffering, Sir Ashley Cooper recommends opium combined with the sugar of marsh-mallows, or simple milk dragees with small doses of sulphate of magnesia. In general the abscess should be opened or broken of itself, unless it should be either of a chronic nature in which case it may be opened in a dependent part with a lancet. Much difference of opinion prevails respecting the practice of opening abscesses of the breast.—I consider Sir Ashley Cooper's directions extremely sensible. "If (says he) the abscess be quick in the progress, if it be placed on the anterior surface of the breast, and if the suppuration which it contains, are not extensively spread, it is best to leave it in its natural state. But if, on the contrary, the abscess, by its communication, be very deeply placed, if its progress be tedious, if the local sufferings be extremely severe, if there be a high degree of sensitive fever, and the patient suffer from profuse perspiration and want of rest, much may be cured, and pain avoided, by discharging the matter with a lancet."—(See Illustrations of Diseases of the Breast, p. 20.) The same experienced surgeon disapproves, however, of introducing the lancet through a dense covering of the abscess, as the opening will not procure a free discharge of the matter, but will heal by adhesion, after which the accumulation of matter will continue. The opening, he says, should be made where the matter is most superficial, and the fluctuation is strongest, and its size should be in proportion to its depth. Scarses sometimes form, and not yet heal, and freely spread with a driblet and mixed honey. When the cavity of the abscess began to be filled up with granulations, the position may be cut off, and a perfect dressing applied.

For stopping the considerable suppuration, which sometimes contains a long white matter the abscess is cured, the most effectual plans are those with concentrated acetic acid, the iodine tincture, or the strong liniment with 1) of the first iodine in each ounce of oil, and the occasional exhibition of purgative medicines, with leeches, in the suppurated callosity, according to the state of the constitution.

If the abscess be small, Sir Ashley Cooper allows the patient suck the affected breast as well as the other; but if much of the mamma be involved in the disease, he lets the infant suck the other breast, and directs the mother to draw the other herself by means of the glass tube described in the purpose. When the child is prevented from suckling by excruciating or violent pain of the nipple, the milk secretaries are large, greatly, and inflammation is excited. Here Sir Ashley also recommends the breast to be drawn; but he thinks, that otherwise the child can be nursed to it the better. He gives a solution of a drachm of borax in three ounces and a half of water, and puts an ounce of spirit of wine, the best application for a sore nipple. Many practitioners use diluted laudanum, tincture of zinc, or wine, or that of calomel and lime-water. Sir Ashley feels that arguments do not precisely agree with the part; but if used, he prefers that of laudanum, or wine, or simple water.

Sometimes, when the swelling is excited, a considerable quantity of milk is discharged, in this case, Sir Ashley recommends a sponge (not to be introduced into the parol, by which means the adhesive inflammation and obliteration of the cavity will be produced).—(See Form, vol. 2, p. 485.)

Mr. Bay describes a very complicated abscess of the breast out of five distinct abscesses, and not confined to prevent her suckling manner. Its situation renders all superficial applications inefficient. The inflammation stage is tedious, and when the matter has matured it is only towards the discharge continues, and there was tendency to healing. Sometimes the matter lodged behind the nipple, as well as in the substance of the gland, and broke out in different places, the intermediate parts of the breast being so affected with a serous infiltration. Numerous abscesses ran in different directions, and, when opened, a soft purple fungus exposed its matter. The disease went on in

one-sixth or one-eighth of the whole, a proportion, however, much greater than what had been at first supposed. But, from a fear that the several single parts harmful to the system, by the cold property which they denoted it to possess, and that it might become watery, rheumatic, or puerile, they combined with it a mixture of ingredients of a warm aromatic nature, or supposed it potent with; for example, oil of cinnamon, nutmeg, cloves, almonds, the sweet oil of lavender, rosemary, and a thousand other substances, which were incorporated with the cathartic. The members, joints, and the whole of the body, except the head, belly, and chest, were rubbed with this composition, and the frictions were repeated at variable intervals, until the strongest signs of inflammation appeared.

The ingredients of the plasters resembled those of the cathartics, only they contained less fat, for which was substituted a sufficient quantity of wax, to give them a proper consistence. This composition was applied to the arms, and the whole body was covered with it, excepting the parts in which it was not liable to putrefaction. The plasters were kept on till inflammation began.

The frictions were made with quicksilver, intermitted while the patient is asleep, or else with creosote. These substances were mixed with tany or resinous bases, such as styrac, rosin, &c., and all the ingredients being reduced to powder, were made into a paste with a sufficient quantity of turpentine or resinous substances. The salve was then placed in a tin, and used on purpose, or under a little kind of heat, and of which the head was generally allowed to partake. A cooling diet, consisting of barley water, was given both before and after the use of these frictions. The patient was left exposed to the frictions, which were made to continue in a profuse perspiration, which they took great pains to keep up and increase, by putting him into a warm bed, washing him with boiling, for about two hours, after which he was rubbed quickly and given some food. The plan was pursued in every day, till a salivation was produced, which was kept up as long as necessary. The method of treatment is described by Astruc, and particularly perspiration, and afterwards for the purpose, hereafter more recommended by Lacombe at Paris, and more recently, by Abernethy in England.

Of the three methods which have just been described, only the first is at present generally in use, and lymphitis is consequently absent. It was found, not only that mercurial phlegms caused heat, redness, itching, and disagreeable eruptions, but that the method was extremely slow and uncertain. Hence, plasters are now only used in tropical climates.

Purges, considered as the only means of curing inflammation, however, although they form a method of applying mercury in a very ancient manner, they are, as already managed, liable to several objections. In this way, it was quite impossible to regulate the quantity of mercury used, which varied according to the greater or less activity of the liver, the pulse of the patient, and other circumstances. The effect of the purge on the organs of respiration also frequently proved very oppressive; and mercury, applied in the way of frictions, might frequently occasion mercurial "pains," &c., that in any other manner. In Mr. Astruc's example, however, frictions, in order to cure inflammation, let only produce it, but the very best way of affecting the constitution.

Frictions with mercury have always been regarded as the best method. They have undergone many diverse changes and by being rendered more specific, have been greatly improved. All the warm aromatic ingredients have been eliminated from the ointment, not only as useless, but as useless and injurious to the skin. It remains now, the question of mercury in the fat has also been very much improved.

METHOD EMPLOYED IN THE ADMINISTRATION OF MERCURY, FOR SCURVILLOUS CONSTITUTIONS, &c.

When entered in the preparation of the medicine, and the nature of applying it, are to be considered, the first thing, the preparation and mode should consist in the best possible, or improvement of the patient; and, secondly, the preparation and mode of administering it, that best remedy conveys the necessary quantity into the constitution. Mercury is carried into the constitution

in the same way as other substances, either by being absorbed from the surface of the body, or from the alimentary canal. It cannot, however, at all times, be taken into the constitution in both ways; notwithstanding the absorption of the skin will not readily receive it, at least, no effect is produced, either on the disease or constitution, from this mode of application. In this circumstance, mercury must be given by the mouth, although the plan may be very improper in itself, in speech, and often inconvenient. On the other hand, the external frictions sometimes will not take up the medicine, or, at least, no effect is produced on the disease, or the constitution.

In such cases, all the different preparations of the medicine should be tried; for sometimes one succeeds which another will not. In some cases, mercury seems to have no effect, either applied externally, or taken into the stomach. Many persons seem to absorb mercury better than others; such are probably all internal surfaces and lungs. Thirty grains of calomel rubbed upon the skin, have not more effect than three or five taken by the mouth. Drawing small doses with the purgative sometimes causes a salivation.—(See *History of the Venereal Disease*, p. 325, 326.)

Before the propriety of putting the mercury into the constitution is solved, it is proper to consider the extent of the patient, each mode having its convenience and disadvantages, depending on the nature of the parts to which it is applied, or on certain situations of life at the time. Hence, it should be given in the way most suitable to each circumstance.

In many, the benefit can hardly be ascertained at all, and it should then be given in the richest form possible, commencing with such medicines as will best be correct in violent local effects, although not so specific as the calomel.

When mercury can be thrown into the constitution with propriety by the external method, it is preferable in the external plan, because the skin is not easily so sensitive to the action of mercury, and therefore is capable of being rubbed with more than the stomach. The constitution is also less injured. Many persons in mercury would not feel the effect, if the medicine were only given internally, because it proves painful to the stomach and bowels, which given in any form, is joined with the greatest corrosion. Every one, however, has not opportunities of rubbing in mercury, and it therefore obliged, if possible, to take it by the mouth.—(See *History*, p. 325.)

Mercury has two effects, one as a diaphoretic on the constitution and particular parts; the other as a specific against a diseased action of the whole body, or of parts. The latter action can only be ascertained by the disease disappearing.

When mercury is given, in venereal cases, the first attention should be to the quantity, and in right effects in a given time, which is then brought to a proper pitch, and only to be kept up, and the decline of the disease to be watched, so by this we judge of the variable osseous effects of the medicine, and when great variation is observably seen, be necessary. The whole effects of mercury affect either the whole constitution, or some parts capable of secretion. In the first, it produces universal morbidity, making it more susceptible of all impressions. It quickens the pulse, increases its frequency, and occasions a kind of comparative fever. In some constitutions, it operates like a poison; while in others, it produces a kind of local fever, that is, a small quick pulse, loss of appetite, restlessness, when of sleep, and a warm complexion, with a number of venereal eruptions, and such effects necessarily diminish on the patient becoming a little accustomed to the medicine. Mercury also produces a poisonous form of the constitution, and makes of a venereal nature.—(See *History*, p. 325, 326.)

The quantity of mercury to be thrown into the constitution for the cure of any venereal complaint, must be proportioned to the violence of the disease. However, we are not guided by two circumstances, namely, the time in which any given quantity is to be thrown in, and the effects of it on some parts of the body, as the salivary glands, skin, or intestines. For mercury may be thrown into the same constitution in very different quantities, or as to produce the same salivary effect, but the two very different quantities may be in different days, for instance, one ounce of mercurial ointment, used in two days will have more

make the sensation experienced from the application of nitrate. The body is passively convulsed, but action is often protracted by very slight causes.

On the first or second day, an eruption usually commences about dusk, the colour of which is either dark or bright red; the papule are at first thickened elevated, resembling very small blisters in texture. Sometimes, but rarely, the eruption appears like articularia, and in such instances the disease is observed to be very mild. The papule very speedily run together, so that it is not unusual to find a confluent eruption, which disappears in process. In most cases, it begins first on the wrists, inside of the thighs, forearm, or where pressure has been applied, and the circumference of the face affected becomes much swollen. There also show themselves freckles, which are tinged with a purplish tinge, and unaccompanied by papule. This effusion itself suddenly over the entire body. Thus, however, may be considered an exception. In every instance which came under my observation, it was confined at first to a few places, and then these gradually extended, until the distended portion of the eruption had gained, and the papule were also raised. But in those cases which resembled articularia, a number of small, vesicles, which contain a straw-coloured fluid, form the commencement, interspersed among the papule. Contrary to what happens in most diseases accompanied with cutaneous affections, the febrile symptoms are much aggravated, and continue to increase after the eruption has been completed. The pulse in general beats from 120 to 140 in a minute, the third cordages are rigid, and the pupils extremely unequal, seldom enjoys quiet sleep. When the eruption has continued in this manner for a certain period, the circle begins to peel off in thin, white, scaly exfoliation, and whilst these are observed in solution. This desquamation has not been attended to by Dr. Harrison or Mr. Alcock, by giving the same name to the desquamation which occurs in the last stage, confining both together. It is common to these places where the eruption first made its appearance, and in this order spreads to other parts. About this period the face becomes much more swollen, and the eyes acquire a somewhat inflamed.

The eruption of this stage is very violent; sometimes it continues from ten to fourteen days, and in other cases it terminates in half that time. When the disease has appeared in its mildest form, the patient recovers immediately after the desquamation, a new circle having formed underneath; but, if severe, he has only experienced the milder part of his sufferings, and the skin now assumes a new appearance, which I have considered as the second stage.

The skin at this period appears as if studded with innumerable minute vesicles, which are filled with a purplish fluid. These vesicles may be expected, at the patient, at the close of the first stage, a complete loss of sensation, and some of burning heat, in those parts from which the cutaneous exfoliation have fallen. This fever sometimes for a day or two, but are more commonly less, immediately after their formation, by the patient suffering there, in order to relieve the from disease afflicts such which these parts are affected. They terminate a series, sometimes mild, which possesses with a very desquamation which is to induce issues in the patient himself, and thus what appears near his bedside. The skin is so tender that it may easily be torn by any person who touches or examines it.

This skin is peeled off most especially from the wrists, front, inside of the thighs, or whenever the skin forms folds, and the underlying glands are most numerous. The entire discharge from these glands would be fatal, with the vessels, an inflammation, which may be considered as the third or last stage.

These eruptions are generally very large, and, when detached, leave the form of the parts from which they have fallen. Their colour is yellowish, but sometimes appears dark and dirty. This period of the disease might be termed, I think, with much propriety, the stage of desquamation, because it is distinguished by the fact from the desquamation, which has been already noticed. From the use of the last two stages I have observed that who have described the disease have mistaken it for the desquamation of a degree of erysipelas which has caused by pressure on the skin, and not by disease. When the stage appears, the face becomes

more affected, the eyes intolerant of light, and the feet swollen, inflamed, and sometimes inverted. The crusts formed on the face, as in other parts of the body, before falling off, divide number, so as to leave cracks and fissures, which produce a hideous expression of countenance; and the eruptions are also, from the general swelling of the face, completely closed. The back and hairy scalp are best affected, and, even in very severe cases, these parts are sometimes observed to escape entirely. The patient, while in this state, is exempted to almost from every kind of motion, on account of the pain which he experiences on the slightest exertion, and which he describes as if his flesh were cracking. The crusts also fall off in such abundance, that the bed appears as if covered with the same of foam. While the eruption is only making its appearance in one place, another part may have arrived at its most advanced stage, so that at the different stages of the disease may be present at one time in the same individual. It is attended with typhus through its entire course, but is very anxious to observe, that the appetite for food is more common, freer than in typhus, and sometimes is even voracious. This voraciousness was particularly remarkable in a patient who laboured under the disease, in its worst form, for the sake of some morsels, in the Royal Infirmary of Edinburgh; for beside the most horrid glowers of food was voracious sufficient to satisfy his hunger. When the cutaneous eruptions have continued during the progress of the complaint, they do at the advanced period pathologically agreeable; the anxiety and pain of the breast are also very severe, attended in its rough, and bloody expectoration, and the patient always looks emaciated and dejected. The pulse becomes frequent, jerky, and irregular, the tongue black and purplish, and of large diameter, constant, continuous, passing over the surface of the body, and death supervening. In its mild form it only passes through the last stage, and terminates, in a large already named, in a few days, by a slight desquamation. But when severe, it is often protracted more than two months, every stage of the eruption continuing perpetually longer, and when, in this manner, it has run its course, it suddenly breaks out on the face surface and passes through its later stages. (Dr. M'Callan in *Edinb. Med. and Surg. Journal*, No. 5.)

The worse state is the employment of mercury. Dr. M'Callan is inclined to believe what Dr. Gregory, that the application of gold to the body while under the action of mercury, is absolutely necessary for its production; an opinion strengthened by the constant prevalence of cutaneous symptoms. However, Mr. Pearson thought that such his no concern in bringing on the complaint in patients under the influence of mercury. At the same time it seems particularly fortunate, that the disease is not exclusively occasioned by mercury, either in its general or more partial attacks; it has been observed to follow exposure to cold, and to occur in the same individual at regular intervals, without any obvious or adequate cause. (Ratnes's *Synopsis*, p. 226, ed. 2. Rather in *Edinb. Med. and Surg. Journal*, vol. 5, p. 140; *Mercur. in Med. Chir. Trans.* vol. 2, art. 9.)

In the early stage, Mr. Pearson recommends small doses of arsenical powder, with either diaphoretics, or the animalia nervosa. A gentle purgative should be given every three or four days, and opium is peculiar sleep. The little vesicular eruptions does not peel when piled with calomel, or Hoffman's anodyne liquor. Symptomatic and both may be given when the feelings are no longer intense, and the complexion has subsided. Various acid has seemed to give relief. The diet may be light and nutritive, without fermented liquors, however, till the desquamation has almost been effected. Prepared out of the water bath, and often changing the patient's diet, and even when such become still and sleep with the discharge, of all such benefit. If the remedy may stand to wait, Mr. Pearson advises washing the body very freely with warm water; he also covers the parts from which the crusts are detached, with a moist cloth, and covers the appearance before a dry. (P. 128.)

Dr. M'Callan advises the immediate desquamation of mercury; the removal of the patient from warmth, where the animal is in one's society and disposition; but, on account of the very sensible state of the humors, no such precautions are hardly necessary. See the

and back part of the eyelids, it would have been difficult to have treated them altogether by local applications.

PREPARATIONS FOR INTERNAL CURE.

When it is wished to excite a salivary gland, and muscular contractility will not produce the effect, mercury is employed, and when frictions are not convenient or agreeable, the hydragryne syzygium or lotion is often resorted to. The concentration is again, which may be increased to two, a day. It excels, however, in contrast with the viscosity and heaviness of many patients; an inconstitute sometimes obtained by combining the preparation with opium.

As puerile the hydragryne can excite is rarely or never prescribed for the cure of the venereal disease. But it is frequently prescribed as a mild alternative for children, is shown of from gr. v. to gr. a. twice a day, combined with any vaginal cathartic.

The advantage of mercury (especially salivary) was a medicine highly prized for its emphysema virtues by the celebrated Van Swieten, and indeed there is no doubt that the other preparations of mercury are likewise such virtues. It retains most sympathy even now, and probably will always do so. However, like the red oxide, it sometimes destroys the stomach and bowels. Some surgeons are still reluctant to give it the same degree of confidence in respect to its power over syphilis, as they give to mercurial ointments. Mr. Pearson remarks, that "when the medicine is given, to give the primary symptoms of syphilis, it will sometimes succeed, even especially when it produces a considerable degree of swelling of the glands, and the transient specific effect of mercury is the usual symptom. But it is often followed by temporary or a recent change; and when the symptoms have vanished during the administration of mercurial salivary, I have known a more powerful course of that medicine fail to secure the patient from a constitutional affection. The action of any mercurials is then simple mercury, calomel, or salivary mercury preparations, such as to be confined to the rate of primary symptoms may constitute salivary. The latter will often check the progress of secondary symptoms very successfully, and I think it is particularly efficacious in relieving venereal pain, in healing ulcers of the throat, and in promoting the disappearance of eruptions. Yet even in these cases, it never yields a permanent benefit; for new symptoms will appear during the use of it; and on many occasions it will fail of affording the least advantage to the patient from first to last. It is sometimes, indeed, employ this preparation in several cases; but it is either at the beginning of a venereal eruption, to bring the constitution under the influence of mercury at an early period, or during a course of infection, with the intention of spreading the action of simple mercury. I sometimes also prescribe it after the conclusion of a course of frictions, to support the mercurial influence in the body, in order to guard against the danger of a relapse. And on some occasions whenever I think it safe to combine in this preparation chiefly and accordingly, for the cure of any truly venereal eruption."—(Pearson on *Local Mercury*.)

The dose of salivary is a quarter of a grain.

The following is a common mode of ordering it. R. Hydragryne syzygium, gr. i. Aquæ Natri Mucosæ, (q. s.) Muc. Dose twice daily.

The substance of *opium* (calomel) is not very much used by modern surgeons for the cure of the venereal disease. Sometimes, indeed, it is given in cases of gonorrhoea, both with the view of preserving the constitutive from infection, and keeping the bowels regular. It is more extensively given as a purgative and anodyne, and for the cure of surgical diseases requiring the system to be slightly under the influence of mercury. It frequently proves severely purgative, when more than two or three grains are given.

The most simple preparations of mercury have generally been derived from the most internally conducting the venereal disease. The plumbic hydrate is the most simple of the internal remedies, being merely mercury mixed with modifications of acidulous substances. Next in internal action, they compare, next frequently employed for the cure of the infection of the venereal disease, that is, while a chance is the only complaint. They are also very extensively given in all stages of the disease, to induce

critical fluxions in bringing the system under the influence of the specific remedy. Two grains of the mass kept for three days will usually do so. When they purge, opium will sometimes prevent this effect.—(See *Venereal Diseases*.)

Mercury, so employed, both constitutionally, and locally, in numerous marginal cases; for the removal of indirect mercurials, and instructions of the parts; for the relief of gonorrhoea, herpetic diseases, eruptions, hydrops antralis, and, and a multitude of other affections, which need not here be specified.

MERCURIC. (Fragrant, the thick and oily, a mixture.) A few words on this remedy.—(See *Mercury*.) MEYERSON was recommended by Dr. A. Rousset for a particular class of venereal eruptions, in the following terms: "The disease for which I primarily recommend the detection of the mercurial part as a cure, is the venereal node that proceeds from a high degree of the morbidity of the blood. In a thickening of the peritoneum, from other causes, I have seen very great effects than it; and the frequency of venereal eruptions is the result of these morbid parts with which venereal eruptions are affected; though in this last case, excepting with regard to the pain that is occasionally the node, I have not found its effects in certain, as I have found it had given to believe. I do not find it effective in the cure of any other symptoms of the venereal disease."—(Méd. Obs. and Exp. vol. 2, p. 134, 135.) Mr. Pearson, however, asserts unequivocally, that mercurials have not the power of curing the venereal disease in any manner, or under any one. Other, if the government should ever reduce the venereal code, as there will be a necessity for taking mercury in as large quantity, and for as long a time, as if no remedy had been exhibited. Certain found this medicine of use in some venereal affections, but, excepting an eruption of the legs, Mr. Pearson has very seldom found it possessed of medicinal value, either in syphilis, or the sequel of that disease, or in venereal affections.—(Pearson on *Local Mercury*, p. 25-26.)

As the possibility of curing most forms of the venereal disease, not only without mercury, but without any internal medicine whatever, is now well established, it is difficult to know at what degree of importance to attach to observations declaring certain agents of the system and its efficacy or inefficiency in the cure of that disease; because, if it admit of a spontaneous cure, but will not get well when mercury or any other particular medicine is exhibited, we are necessarily obliged to suppose that such medicine is worse than useless.

MOLLUSCÆ. The venereal sign of a trepan.

MOLLUSCÆ OREUM. A morbid softness of the bones, which becomes progressively flexible, in consequence either of the insensible absorption of the phosphorus of bone, from which their natural solidity is derived, or of the matter being directly secreted into their texture. The bones affected become specifically lighter.—(See *Light*, *Moll.* in *See* *Reynolds on Moll.* 2, 3.) Dr. Boeck made some experiments, with the view of ascertaining the proportion of earthy matter in bones affected with mollusca: he obtained a dried vertebra of a woman, whose bones were found soft and flexible after her disease. In one part of the dried bone, he found that the quantity of earthy matter only amounted to one-fifth of its weight, and, in another, only to one-eighth, while the proportion in healthy bones amounted to one-third the weight of their whole weight.—(See *Moll.* *Chir.* *Treatise* and *4.* and *Wilson on the Bones and Joints*, p. 335.) In bones, the bone yield, and become dissolved only by slow degrees, and retain their natural flexibility; but in the present disease, they may be at once bent in any direction, and frequently absorb of being readily divided with a knife. The mollusca system is an exceedingly morbidly diseased, and on a large scale is a disease. It is reported, however, to depend upon disease peculiar to the constitution, and the individuals affected with it have been remarked to be exactly about as much beyond the juvenile period of life (J. Wilson, *loc. cit.* p. 222), and generally, if not always, women.—(See *Wilson on Mollusca* in *See* *Reynolds on Moll.* 2, p. 172. *Practical Cases of Mollusca*, 1, 2, 3, 15.) The system, however, is reported, in which the patient was a young man, numerous years of age.—(Theobaldus, in *See* *Wilson on Moll.* 2, p. 225.) Surgical writers have usually

phlegmatic masses, and early first involution when the cellular membrane and basement, and a considerable of suppuration and mortification is beginning under the skin.

The symptoms of mortification from inflammation take place suddenly, yet gradually as follows.—The pain and sympathetic fever commonly diminish, the feet are affected by a cold, and of a livid colour, being at the same time, more or less of its natural warmth and sensibility. In some places, the system is detached, while in other situations vesicles arise, filled with a clear or turbid fluid. Such is the state in which we apply the term gangrene, and which stage of the disorder has often rapidly advanced to extinction, when the part becomes a cold, black, Alburnous, senseless callosity, called in technical language a clough.

In some cases, however, there is a stage in which gangrene immediately succeeds inflammation, when two or three days may, in some measure, be regarded as stages or periods of the same disease. They pass immediately into one another, so that it is possible to say precisely where the one state ends, and the other one begins. The symptoms of inflammation in these cases do not disappear before those of gangrene come on; but when either is enlarged gradually and almost imperceptibly, or commences, like the other, the colour acquires a dusky tinge, and extends far, like this form, the swelling increases and becomes more dense, and at the simplest stage, the gangrene, particularly where it attacks the extremities, is visible, often from a considerable remission in the system. — (See Thomson's *Lectures on Inflammation*, p. 200.)

It is to be observed, also, that the part of the body which becomes affected with gangrene does not immediately lose its sensibility, for the pain, on the contrary, is often very much aggravated by the approach of this state. The affected part continues to swell, at least in the larger vessels of the feet, but perhaps not the feet; and from the resistance which it meets with in passing through its capillaries, it is not gradually but suddenly. The swelling ceases, and the cellular membrane contracts, to resume, and the action of the affected and impeded vessels is diminished, the part becomes at length incapable of being restored to its former office in the animal economy. It is, therefore, in its earlier stages only, that gangrene is to be considered as an amiable subsiding of life; for these are those, beyond which, if it progresses, becomes impossible. These limits it may not, in every instance, be easy to define; but they give the boundaries between unimpeded gangrene and the ultimate termination of that state in sphacelus. — (Thomson, *op. cit.* p. 207.)

The causes which produce mortification by impeding the return of blood from the part affected, for the most part, operate by making pressure on the trunk or principal branches of a vein. In these instances, there is always an accumulation of blood in the part which for weeks, becomes of a livid colour, tense, and very painful. Such afterward follows ulcer, and the part becomes black, indurated, cold, insensible, erysipelatous, black, and firm. Such are the circumstances which happen in strangulated hernia, in testis, and in a limb in which the veins have been so long pressed by any hard swelling, such as the foot of a flat-winded horse, as to cause mortification.

Other causes operate by preventing the entrance of arterial blood. The application of a ligature to an artery, as practised in several surgical cases, and all external pressure, that closes the artery or arrests its action, in part, obviously depends for its supply of blood, from the effect. Mortification does not, however, always take place when the trunk of an artery is rendered impassable, because nature supplies the means, by supply of blood through collateral channels. For when the disorder does happen, the part gradually first becomes pale, black, and cold, and soon afterward shrinks, loses its sensibility, grows black, and pained.

In some cases, the mortification proceeds not simply from the interruption of the course of the blood through the principal artery or arteries, but its occurrence is promoted by great violence done to the feet, and in particular by the compression and distention of the cellular membrane with effused blood. No doubt all these causes operated in the fatal example of mortification

which followed a fracture of the thigh, attended with laceration of the femoral artery, as related by Mr. A. Cooper. — (See *Lancet*, vol. 1, p. 286.)

It is usually represented by authors, that mortification only proceeds from a more lowering of the compensation of blood and nervous energy to a part. However, it is to be observed, that parts deprived of all connection with the system, by the division or paralytic state of their nerves, do not frequently succumb to this accident. But as their functions are varied as with less vigour, and their vitality is enervated, the same causes which sometimes produce mortification in parts differently circumstanced, may much more readily occasion it in them. Among the causes of the present species of mortification may be mentioned, great debility, extreme old age, a thickening and ossification of the coats of the arteries, and a consequent diminution of their capacity, and of their muscular and elastic power.

A Fracture, the mortification was one of the earliest effects which took notice of this interruption of the arteries of the leg, in persons who had a great accumulation of the feet and toes. — (See *Phil. Trans.* vol. 22, p. 135, and vol. 24, p. 179.) A similar case was attended by Mr. Keckel, of which he has given an account in his *Chirurgisch-physiologische*. The section was afterwards described by Nauck. — (See *Phil. Trans.* vol. 31, p. 426.) Dr. Thomson has given an example of a very complete obstruction of the arteries of the leg, accompanying a distention of the feet and toes. — (See *Inflammation*, p. 337.) Speaking of the same writer, Mr. Haller remarks, "Experience has proved that obstructions of the arteries rarely at least a constant attendant upon every species of gangrene, to which the extension of cold subjects are liable, and I have found the three principal sources of the leg rarely obliterated by calcification, either in one fixed case of this disease. But our knowledge of the power of calcification, in every part of the body, will not allow us to reject the obliteration of the vessels as a sufficient cause of mortification from a deficient supply of blood. It is therefore necessary for us to remember, that the same disease may probably exist in the collateral branches, upon which it has produced similar effects. But if an extent of vessel be completely blocked up by a thrombus, it loses its elasticity and contractile power, so as to be unable to afford any assistance to the propulsion of the blood; and the existence of pain, supplied by vessels in this state, constitutes a strong stimulus against the agency of the arteries in the circulation of the blood. The above observations, on the cause of this species of gangrene, at once expose its inevitable nature, and the state of the blood-vessels renders the danger of amputation very considerable, unless fortunately the disease in the arteries does not extend as far as the ligature is applied." — (See *Halliday on Diseases of the Arteries and Veins*, p. 61.) However, although the vessel is in an artery, it is not certainly to be considered as being in a state not constantly prevent its desirable event. — (See *Cutis in Arterio-Chir. Trans.* vol. 6, p. 183.)

The preceding facts are particularly entitled to attention, because, as we shall presently find, the opinion that the mortification of the foot and toes arose from no obstruction of the arteries was considered by Mr. Fox as decisive of Ischemia.

It is probable, however, that sometimes other causes are concerned. Edouard Hildrey mentions a fatal case of mortification of the feet and toes, where the patient was in the vigour of life, and apparently of good constitution. After death, a circumferential was found surrounding and compressing the inferior vena cava and aorta, near their bifurcation, so as to prevent the free circulation of the blood in the lower extremities. Mortification of the extremities also sometimes constitutes a direct consequence in the progress of distention of the heart. In a case of dropsy of the chest, Mr. A. Cooper has seen a case upon the feet before all were black, without any appearance of clough. — (See *Lancet*, vol. 1, p. 286.)

The mortification arising from Ischemia continues in the same posture, is slowly advancing to debility and the interrupted pressure which parts sustain, and which obstructs the circulation. Scarcely have the feet occasion to see such a variety of examples of this kind of mortification, particularly in cases of fracture, gangrene from disease of the vessels, laceration of the

under their natural. The blood circulated through them, and returned in supplying with nourishment the parts upon which they were distributed."—(P. 321.) I have often seen the truth of the foregoing statement fully illustrated in cases of circulating tumors, by which several ligues of the human artery are exposed. I have seen the branching bronchial artery situated for more than a month, exactly in its whole extent along the side of the arm, by the ravages of syphilis, and periods of phlebotomy, attended with repeated sloughing; and yet the vessel had no share in carrying off the morbid matter.

It is a curious fact, that the blood coagulates in the large arteries which tend to a mortified part. This occurrence takes place in mortification from the slough, and it is the reason why the separation of a mortified limb is seldom followed by hæmorrhage.

The same occurrence also affords an explanatory key, to the appearance of a mortified limb, there is sometimes hæmorrhage from the vessels, although the limb has been made in one, living part. This fact was first satisfactorily pointed out by Petit the surgeon.—(See *Ann. de Chém. et de Médec.* 1792.) "When a gangrenous limb (says this celebrated surgeon) is cut off in the dead part, no hæmorrhage occurs, because the blood is coagulated in that way in the vessels." He adds, "We have several examples of limbs separated, on account of gangrene, in which no hæmorrhage occurred, although the separation was made a considerable way in the living part; because the clot was not confined in these cases to the dead part, but was continued forwards into the living, as far as the inflammatory disposition extended."

According to Dr. Thomson, (and in confirmation of the foregoing statement as recorded by other medical writers, especially Quercus, and St. O'Halloran.) In one of the cases mentioned by the latter gentleman, and in which no hæmorrhage followed the removal of the limb, the ligatures were made over inches above the division of the dead from the living parts. Dr. Thomson has seen a still larger portion of human artery closed up with coagulated blood, after a mortification of the foot and leg; and, in one example, when the mortification began in the thigh, he saw the coagulation of the blood in the external duct, extending up to the origin of this vessel from the aorta. "So copious, indeed, is the coagulation of the blood in the limbs affected with mortification (observes Dr. Thomson), that it has been supposed to be a necessary and essential effect of this disease. This opinion, however, does not appear to be well founded; for I have seen several instances in which a limb was mortified and dropped off, without hæmorrhage having occurred from the vessels divided by nature; and yet, in examining the vessels of the stumps of these patients after death, I have not been able to find any clots, either of coagulated blood, or of coagulable lymph. In the cases in which I believe the adhesive inflammation, proceeding in the line of separation between the dead and living parts, had extended to the blood vessels, and their lower surfaces, being inflamed and pressed together by the swelling which occurs, had adhesion as it so close up their communication. It is in this way we must find that the hæmorrhagic ligature, which is applied to the divided extremities of arteries and veins, and it is this adhesion by the process of adhesion of the extremities of the arteries and veins to the neighbouring parts of the coagulated mass, that is really prevents the recurrence of hæmorrhage when the mortified limbs fall off, or are removed by the knife. The coagulation of the blood in the canal of the vessels may also be sufficient. It may tend, in instances in which it occurs, for a time, to restrain hæmorrhage; but it fully illustrates by its extension to the blood in the substance of the arteries and veins that the recurrence of hæmorrhage can be neither and permanently prevented against. Indeed, to me, it seems doubtful, whether the coagulation of the blood, which takes place in mortified limbs, ever takes place in the canal of the vessel, till its extremity and lower communication have been closed by the coagulated lymph which is exuded during the work of the adhesive inflammation."—(See Thomson's *Lectures on Inflammation*, p. 324.)

If gangrene and sphacelus happen to any extremity, it is usually treated with an escharotic.

—A surgical well known to the surgeon

of experience, and often an indication of the mischief, when external signs are less instructive. The truth of this remark is frequently seen in strangulated hernia.

The gangrene also rather immediately a consideration depends. The patient's countenance suddenly assumes a wild cadaverous look; the pulse becomes small, rapid, and sometimes irregular; and perspiration comes on, and the patient is often affected with vomiting, diarrhoea, and delirium.

As Dr. Thomson observes, the constitutional symptoms "often precede, which partake in individual cases, more or less, of an inflammatory, typhoid, or bilious character. But the degree of these differs, in every particular case, from their almost total absence to the highest degree of intensity. The skin is usually hot and dry at the commencement of the attack; the tongue becomes acuminated, brown and furred; the pulse quickens, and less full and strong, than in inflammation; and the state of the pulse is often attended by fluctuating intermittence, and a considerable degree of subjective tenderness. The fever has, in general, more of the hectic than of the typhoid character; as it is more of the typhoid than of the inflammatory type; a circumstance of great importance in the constitutional treatment of mortification. The fever is progressive, and is often accompanied with great anorexia and restlessness, dependent of spirit, weakness of the limbs, and almost always more or less delirium. In the progress of the disease, cold sweats, delirium, and convulsions sometimes occur; a frequent, unaccompanied with nausea, often comes on, and proves a most distressing symptom to the patient. Frequently this delirium is the forerunner of death, does not pass the common stage, after suffering severe pain, spasms, and delirium. But in some, a fever, in others, a sudden subsidence of the constitutional symptoms takes place, accompanied also with the subsidence of the local affections. The commonest inflammation next, and a red line is formed by the adhesive inflammation in the extreme verge of the living part, the dead part separates, and granulation forms; and when the coagulation has so much to sustain the way it has needed, recovery takes place."—(See Thomson's *Lectures on Inflammation*, p. 324.)

It is an erroneous supposition, that mortification, arising from an external local cause, is more easily stopped and cured than that originating from an internal cause. The local cause is sometimes extremely difficult, or even impracticable to remove; and a sphacelus, which is at first merely local, may afterwards become a general abscess, by the internal debility and disorganization of the system, resulting from the complaint. Hence, it is obvious, that a sphacelus may easily extend beyond the limits of its external local cause. On the other hand, a mortification may be reduced to one of a remote variety local; though it arise at first from constitutional causes. Sphacelus from venereal debility, or from such a state of the system as attacks the struts, typhoid fever, &c. is constantly passing, because these causes are very difficult to remove. It is also a fact, that when venereal causes are considered, it is an unchangeable occurrence, not merely because the suppuration is checked, even of those, but because there are in reality associations to the cure.

Hæmorrhages, which are frequently accompanied with mortification of the cellular membrane, usually extend with great rapidity.—(See Jones's *Lectures on Inflammation*, p. 324.)

Sometimes a mortification spreads so slowly, that it does not occupy much extent in the end of several months, or even a whole year. The case, however, is often still the best in this respect. The danger is never altogether over, until the dead part has completely separated. The removal of putrid matter into the circulation (says Richter) is so injurious, that patients subjected perish from the disease. Now after the mortification has ceased to extend.—(See Richter's *Med. Pract.* 1. 2. p. 727.)

This last circumstance is very worth recollecting upon by all the modern medical surgeons; for the doctrine has never gained ground among English surgeons, who entertain little expectation of the bad effect of the absorption of putrid matter in cases of mortification; and the opinion of Mr. Guthrie may be more correct, that nature performs the check through the nervous system, and sometimes the sloughs.—(See Guthrie's *Principles*, p. 121, and 2.)

ing situation may be external agencies, atmospheric, medicinal, &c. In general, however, was internal, because more agencies than outside; and for this purpose we ought to prefer the most perfect means such as those of Hygieine and Medicine.

Of all the mortifications here recommended for the suppression of inflammation, three are adapted with a characteristic efficacy to the Pterygoid body. It is not that this remedy often stops in a very early and superficial manner, but for the reason of the disease. Being a very powerful body, it is thought to operate by strengthening the system, and thus impeding its every part the necessary power for meeting the progress of mortification. But whatever may be the mode of acting, the advantage for this medicine is, that it ought to be employed in almost all cases of mortification, as seen in the violence of the inflammatory stage, and the loss of appetite.

It was Mr. Southworth, surgeon at Northampton, who made this discovery in the year 1714. After him and Boisson, two surgeons in London, were afterwards confirmed the virtue of this remedy. Mr. Boylen, another English surgeon, also discovered, in the *Philosophical Transactions*, the good effects which he observed by it. In the *Medical Essays of Edinburgh*, Drs. Mead and Hunter published several cases of mortification of the pterygoid. We are then informed, that when the inflammation was interrupted, the separation of the artery was attended, and that as the surface being exposed to air, the separation would progress more quickly. Since this period, physicians in England and elsewhere have employed this very body in the treatment of mortification; and the repeated statements of its efficacy led us to exhibit it in all cases of this nature without discrimination of the varying state of the general health and local disorder in the different stages of the complaint, and without any reliance on its action and nature, which are subject to variety.

We cannot indeed deny that bark has frequently had the best salutary effect in cases of mortification, though sometimes it may probably have had its effect in it effects which were entirely produced by nature. The following observations made by Dr. Thomson are highly worthy of recollection. "In attending to the effects supposed to result from the operation of the external and internal remedies which are daily employed for the cure of mortification, there are two facts, well ascertained, which appear to us to be generally deserving of just regard. The first of these is, that mortification often stops spontaneously without any consideration whatever from treatment; the second that it often begins and continues to spread, or even after it has stopped for a while occasionally, and succeeds to a fatal mortification in spite of the best directed efforts of the healing art."—(*See Lectures on Inflammation*, p. 227.)

It is quite wrong to prescribe bark in every instance, for there are many cases in which it is counter-indicated, in which it does harm, and still in which it is locally beneficial. It is a mistaken notion of its service when the mortification arises from an external cause, and is the only expedient in a healthy, strong constitution. It is especially unnecessary when the inflammation is of the dry sort, and has crossed the point at the same time that the living tissue appears to be in a state of exhaustion without any increased ability. But if disease particularly arises, that the circumstances of each individual case are liable to be considered, and varied, that though bark may be of great assistance, it may also be indicated.

When mortification is complicated with various disorders of the functions of the bowels and stomach, a very frequent case, bark is chiefly beneficial. Here, the indications to remove the state of the stomach and bowels, with cold opening medicine, and especially calomel. When this has been done, if bark should be indicated by any of the circumstances already pointed out, it may be safely administered.

Sometimes mortification is accompanied with a very typhoid kind of fever, which, whether the cause be the consequence of the local mischief, or impairs the exhibition of bark.

However, mortification may be attended with some inflammatory fever, and then the living margin is actively inflamed and painful. This is particularly the case when mortification is the consequence of

pressure upon inflammation, or of an external injury, to a healthy subject. Here bark need scarcely be administered. Still it is wrong to regard this mortification as necessarily limited whatever sympathies is the extent of inflammation. It has already been observed, that the inflammation frequently has less extent in the origin of the disorder, than in a venereal case, which often requires the exhibition of bark. Even when mortification is the pure effect of inflammation, great protection of strength may subsequently arise, and indeed does regularly take place at a certain period of the disease. In this situation is the voice of experience loudly proclaims the utility of bark, though its exhibition would have been at the time of local inflammation. While genuine inflammatory fever and local inflammation are co-existent with mortification, emollient means are undoubtedly useful; but great caution is requisite, since, in cases of local disease, as it is termed, the inflammatory state very soon changes into one in which the great danger is prostration of strength.

When there is some prostration of strength without any symptom of gastric disorder, or of inflammation, at all typical, bark is evidently proper, though without effect above; diaphoretic and nervous medicines being also necessary, opium, wine, camphor, ammonia, brandy, &c.

We even with rare exceptions mortification in which the pain is experienced more than in the past, without the marked appearance of inflammation. Altho' bark is never of much use, and opium has been resorted to as the medicine in which we should principally reside. This subject will be more fully considered presently, when Mr. Pitt's remarks on a possible mortification of the bowels and feet will be introduced.

Early measures of calomel, and then if want be immediately pronounced, these first salutary effect can be prevented by the addition of a few drops of laudanum to each dose, or by employing the sulphate of quinine instead of the common preparations. Bark frequently disagrees with the stomach; in which case, I should say, think ought not to be continued at all; though, in this circumstance, the usual plan has been to give, instead of the decoction, the infusion of the powder finely divided, and mixed with wine, or some aromatic water. Since the sulphate of quinine is likely to prove the most prepared of bark; but further experience with respect to its real efficacy is still needed.

Several years ago I published a critique on the in-discriminate employment of bark in cases of mortification, and my remarks were inserted in the *British Dispensary*, Dr. Mead's *Cyclopedia*. Many of them were introduced into the second edition of this *Medical Dispensary*, printed in 1815—(*See Dispensary*). Since that period, I am happy to find that the first mortification in which bark was prescribed is beginning to subside, and that on this subject some eminent surgeons have of late publicly avowed themselves which entirely coincide with my former statements. "I think," says Dr. Thomson, "I have frequently seen it very useful when administered in cases of mortification, by lessening the amount of the patient, preventing a shock to food, and sometimes in so doing an obdurate diarrhoea. I believe it to be in mortification a medicine completely forgotten in medicine."—(*See Lectures on Inflammation*, p. 563.) By this expression, Professor Thomson does not mean that bark can never be useful in cases of mortification, but only that it has no specific power in checking the disease, as many have erroneously imagined.

Bark (says Boyer) has been considered, by several distinguished English practitioners, as a true specific against gangrene in general, and especially against that which depends upon an internal cause; but subsequent observations to those published in *Lancet* have proved, that it has no power over the inflammatory state of gangrene, and that it only acts as a powerful tonic in stopping the progress of the disorder, and preventing the separation of the mortified part."—(*See Medical Essays*, 1, p. 111, Paris, 1814.) Boyer also particularly alludes to bark being given while inflammation fever prevails; but whenever he prescribes bark in cases of mortification, he seems to neglect the old preparation of a powerful tonic, in preference to the quantity which can be got into the stomach. On this subject, Mr. Gualtero tells us that he has mortified

slightly to be divided with this complaint. The position would be also soft, smooth, and unassuming; the distention should be slowly increased, and rather, it should be symmetrical than tubercular, white, and part of the red distal should always be in order, or nearly so, not to be freely to become at any critical harpness and drawing and another."

Dr. A. Cooper generally recommends a position composed of part tense and muscular, or that made with stable long pressure; but in that case which I attended with him in various positions, and which will be more fully mentioned, as treatment of inflammation, occasionally one of the characters of cold, and residual problems were all used in vain. Indeed, the very nature of the disease leaves little hope of successful good therapeutic applications. All that can be expected from the best of these is some denudation of parts, and from the want of heat an increase of it, with a more rapid extension of the agglutinated particles.

When the legs are to all appearances, perfectly unaffected, and seem as those as to be capable of being easily taken "away," it is in general thought right to remove them. But however long they stay on, if they be violently twisted off, or the parts by which they hang be divided, a very considerable degree of pain will most completely attend both operations, which however had much better be avoided, as Mr. Pott has seen this very pain they produced from a dead limb twisted, and that of the gangrenous kind. If the patient does not feel these parts will certainly drop off, if he lies out of bed can arise from drawing these.

When the disorder is attended with a great deal of irritation, every subsequent practitioner have allowed the efficacy of opium; though it has not always had the same success in other hands, when the constitution is dependent chiefly on constitutional debility. Dr. Keil had observed, that we must be careful not to give the doses, especially of this; and that the benefits that more than this good when the superior effects go so far as to remove debility, and give the appetite, or cause affections of the heart. Sir A. Cooper joins opium with salutarina, or camphor, and at a time which I have attended with him, he also permitted opium, and wine and opium were allowed. As far as I could judge, the remedies which seemed to have the best effect in producing the patient's continuance in bed, the supports of opium, and camphor, with other mild agents.

It is the nature of the complaint. Position, attributes considerable efficacy in it, as has given at the dose of five grains, twice a day, double quantity of wine, every day.

Five surgeons of the present day believe that opium possesses as much power in the preceding cases as Mr. Keil expressed. While Dr. Yessier affirms that opium is much more essential to the attention of practitioners who look to the treatment of inflammation, yet the observation "I would not by any means have you to put the same reliance on its power as I have seen in the mortification of the toes and feet in all people, where opium to have been done by Mr. Pott. From the facts which I have made, and which have been made by others, I cannot after myself to believe that its present stopping this mortal and of mortification are greater than in any other form or variety of the disease. It is obvious, however, from Mr. Pott's account, that his mind was strongly impressed with a very different opinion. The opinion stated which has been formed from the results of a very small number of cases, and is completely contradicted by the available observations of his successor Mr. Keil, with regard to the frequent inefficiency of opium in the treatment of mortification of the toes and feet."—*See Pott's Lectures on Inflammation*, p. 120.

I believe that this method of mortification very rarely attacks both feet. One mortification proceeds in stages as we have seen, however, I attended in the summer of 1822 with Mr. Hughes of Hildesheim, and the gentleman was the subject of the disease was also treated by Mr. Arthur Cooper. Both feet and legs were attacked and gradually mortified, and up to the knees. The patient lived a month after the commencement of the disease. During most of this time the urine was from 100 to 120, and the stomach as little affected, but the patient died generally in an exhausted state.

For dinner until the last two or three days preceding his death. Until the final stage, when was actually dying. Two circumstances were particularly noticed; first, that the disease never extended itself without being preceded by violent pains in the parts about to be destroyed, so that a patient could always be formed determined from the degree of suffering, whether the progress of the disorder should be made, desirable or not. Secondly, that the process of mortification, and its appearance in one leg, were totally different from those exhibited in the other. In the left, the disorder began on the inside of one of the toes, and followed the course described by Pott in this sign, a general distention of the temperature of the foot and leg was the first thing noticed, without any denudation of the skin, or any excruciating heat on the toes. The redness, after subsiding very much, was followed by total loss of sensibility in the parts, and the cessation of the circulation, and every other sign in them; the foot being little more changed in appearance than that of the healthy and healthy.

2. With respect to the external or local treatment of mortification, the first indication appears to be, inasmuch as possible, to effectual means as may have influence, or kept up the disorder, as the consequences of hardness, tenderness, lameness, or swelling, edema, etc.

When an inflammation spreads from inflammation, which will produce in a considerable degree, it is a case that the dead part will only cause secondary inflammation, and that the principal consideration is to prevent the mortification from spreading to the living tissue, by lessening the inflammation present. Hence, under such circumstances, the application of heat with the warmest oil, and the maintenance of a moderate exposure, from the inflamed parts, surrounding the mortified part, must be just as proper as if the inflammation itself did not exist, and were quite out of all consideration.

It has been justly remarked by an eminent man (*Monro*), that the local treatment of mortification (meaning that its proximity of inflammation has been as stated on the constitutional), notwithstanding have been made down to the living parts, is only that stimulating and sympathetic medicines might be applied to them; such as turpentine, the warmer balsams, and sometimes the essential oils. Warm fomentations have been also applied, as being essential to life; but warm always increases action, and should therefore be well adjusted to the case; while, on the other hand, cold dilutes or lessens power, when carried too far, though it lessens action. Medicines are likewise improper, as the patient is already too weak. It is proper to keep the parts cool, and all the applications should be cold. In cases of mortification from inflammation, good effects have also been seen to arise from the topical as well as internal employment of opium.

But it must be acknowledged, that however proper the employment of cold applications may be in principle, in most of mortification attended with certain causes, fomentations and moisten positions are most commonly preferred in practice.

Refrigerant positions, there are several others which have acquired great celebrity as topical applications in cases of mortification. Of this kind are the distillations carbonic, sulphuric, camphor, and the camphor, all-fresh, in air, even on other subjects, they exert heat than any other.

With respect to stimulating and irritant applications such as leeches, spur of wine, blisters, trichs, and aromatic substances, which have been recommended by a vast number of authors, they are usually abandoned by modern practitioners. Though such things are indeed really useful in preventing distant vital substances from becoming putrid, a very little

* Prepared by mixing about 2 1/2 of finely powdered whole cloves with half a pint of the common alcohol.

† Prepared by mixing into the mixture of strong beer as much camphor as will make the mass of suitable consistency.

‡ Prepared by stirring into the infusion of malt as much camphor as will render the substance of a proper thickness, and then adding about a spoonful of yeast.

is immediate contact with immediately dead. This is indicated, but the parts still alive and so situated should experience the same fate as the contiguous ones. In most of the other cases quoted by Dr. Thompson, my experience leads me to prefer violent sequestering operations, some of which are stronger than the cataplasma rubrum, in the state here, forming, however, an earnest position. When the process by which a slough is detached is somewhat improved, I have seen a good isolation of the contact of organs in water but under the most favorable position, along the line of separation, give considerable more, in the same time that it seemed to produce the changes by which the dead parts were absorbed.

In the gangrene produced by venous and weakness, it seems that the tissue is impeded by increased and injurious to be for weeks and months in some position, the mode of treatment is a matter of extreme importance, and frequently upon the difference of life or death to the poor sufferer. This affords nearly but not in such which are but thick covered with vascular fluid. It seems beyond the latter stages of long continued tissue changes, as after typhoid or hectic fever, attended with tedious sequestrations, or even without these fevers, as in puerperal, and in very bad congested breasts. However, as Dr. Thompson observed, there are two forms of disease arising from posture which have not always been sufficiently distinguished. One of these is the preceding sort of elongation, the other is a chafed, excoriated, and ulcerated state of the part.

Sequelae of mortification tends to cause this sort of excoriated state, that is, to induce a white with the patient's excreta. When this is the case, great irritation is produced by every possible action. If the skin be excoriated and broken, the powder of tannic or tannic calamine, should be sprinkled over the part, or it is as advised by Dr. Thompson, those which contain the oil of turpentine. But when the chafed state of the skin is cured, these remedies are to be laid aside, and an excellent, benzoic, camphor, or stimulating poultice used.—(P. 282.) This seems to be the safe state of such irritation, the solution of epinephrine under a constant heated position, as above given, then may offer advantage.

Dr. A. Cooper recommends the application of nuxvomica. Sometimes he uses a mixture of vinegar and camphorated spirit.

But no topical remedy will insure of these cases and, among the chief cause of the disorder be removed. This is to be effected by change of position, and by the action and condition of the affected parts in convenient places under the patient, not directly under the disease itself, but in situations where they will tend to raise the parts affected from the contact of the bed. A constant hollow pillow will often accomplish this important object: but when possible an entire change of posture is to be preferred.

When nuxvomica succeeds in gangrene from pressure, I have given from camphorated spirit applied: but never with decided advantage. A constant camphorated poultice and in very bad cases the topical use of the solution of epinephrine, when the living margin, are the means upon which I place the most reliance, but these have to be supported by general health, without which active medication neither the spiritual of the patient nor the vitality of any dressing will succeed. Dr. Thompson speaks most highly of the fermenting poultice, which I believe to be in these cases an excellent application. He concludes, however, that he has sometimes found it too irritating, and been obliged to substitute the simple camphor, camphor, or turpentine poultice.—(P. 286.)

When mortification arises from cold, exposure of high exposure, application may be avoided, and cold water, if this again is not required.—(See Case 11.)

The local treatment of the mortification of the fingers and toes, as described by Mr. Pitt, has been already mentioned, and it is this in which the observation is made use of greatest practical.

The gangrene observed of the padua, in which square incision are made, was successfully treated by Mr. K. Wood, by applying the hyperphosphoric acid. It is a simple, and broad position made with the same action. As even in the above history, that, they were treated with the hyperphosphoric acid.—(See

Med. Chir. Trans. vol. 7.) Other cases which also ended well have been treated with list applied in camphorated spirit, and covered with a poultice, or, at first, position made with the spirit rubrum, and after the separation of the slough the ulcer was dressed with good wine and solution of bark in equal proportions. Success cases, however, notwithstanding several instances.—(Journal of Hygiene, p. 303.)

Dr. Thompson is of the opinion, that the separation of the parts in all cases. They even advise the patient to be laid down in the sound position in order to facilitate the application of topical operations, and to favor the separation of the supposed anastomotic qualities of these dressings. But with the exception of those in which the gangrenous parts are under an exposure, or others in which the anastomosis which have caused destruction cover a surface of matter and slowly change solution, there is no consequence of dressing inflammation in any other cases than in the extrusion of slough in the second, the third, or fourth, which presents in the active living parts, even when produced by the most severe frostbite. Instead of advantage. Such incisions cannot be performed without producing a great deal of pain, and producing inflammation, which often induces the mortification spread still farther. But in parts which are in a state of exposure anastomosis anastomosis anastomosis is regarded as those which will cause their vitality, all such portions of tissue as is already loose should be removed. By leaving the most vital part of the tissue in a condition, in which any anastomosis be made for the escape of a great deal of plasma discharges, which being evolved might have a bad effect on the neighboring living parts, and the latter are treated to be themselves freed from the effects of the slough.

The two common modes of accelerating with a cutting instrument the separation of the mortified parts, properly to the completion of the process by which nature breaks the connection between them and the living parts, in general ought to be strictly regulated, as cutting anastomosis produces irritation, and exciting the risk of a renewal of the sloughing. As far as experience goes, gangrenous sloughs are the only instance in which it seems useful to remove the sloughs before they are loose, so as to let the typical appearance extend their action without delay in the advanced living surface.—(See Hospital Gangrene.) Part's treatment with respect to the finger and usually or cutting the sloughs and ligaments, in the mortification of the toes and feet, have been already stated.

If the patient perfectly let nature work, without disturbing her, the separation of the mortified from the living parts will soon figure the establishment of the anastomosis and separation of the dead from the living.

But when the whole thickness of a limb is affected with mortification, ought the surgeon to leave things to nature? or ought he to take measures to amputation?

In general, the performance of amputation is inadvisable, and that usually would be to cause anastomosis between the amputated part, but because a great length of time would be required for the completion of the process, and a serviceable stump would rarely be left.

Another important question then arises, should the surgeon amputate the mortification in a second stage? Or ought he to defer the operation until the line of separation begins to form between the dead and living parts?

In the amputation of the toes and feet, in all cases, Dr. A. Cooper forbids amputation whether others be healthy generations or not, and he declares that if the operation be done, mortification of the stump will be the patient's death will certainly follow.

Amputation says a distinguished professor with long regarded as one of the most important operations which could be employed to prevent the extension of gangrene. This practice, however, has not received the sanction of experience: on the contrary, it has been generally found, wherever it has been practiced, in either acute or chronic gangrene, to coincide with the progress of the disease; and in this way to hasten the death of the patient. The parts which were divided in amputation, though in a distance from a spreading gangrene and from the patient, were found

ing, and saved his life, as that is the conclusion of this case of Alexandria he was quite cured.

"After the taking of this, Mr. Lundy resorted to his majority the surgeon, performed as my patient, and in my ambulance established. Following the acquisition of the first of a soldier belonging to the 5th regiment of the first, the leg having sustained a contusion of a gunshot injury. The gangrene was not formed, and evidently ascending itself, yet the effects of the disorder were delayed, and the patient was left to turn to his rest in Alexandria.

"A faint patient, in office in the same regiment, who in the table in the capture of the same town, was conveyed to my ambulance, as noted in the record. It was the third day after the incident. The foot was gangrenous, and the leg was swollen, and I observed the patient with satisfaction. Before symptoms had been observed, I observed in the leg a little above the place of clasp. The whole member of the stump, of a yellowish black color, was already infected with the gangrenous process (as Lundy found it). The operation, however, stopped the progress of the mischief; separation took place in the stump; some clots were detached; the wound seemed a cleaner appearance; and continuation was completed on the fifth second day. The patient stood steadily with a wooden leg, when I caught the hospital staff, which was broken at Cairo, before he arrived in the hospital, and, to my great regret, he was carried off by this disease, after having escaped the former danger.

"After the landing of Alexandria and Jerusalem (see Lundy), several of my colleagues, surgeons of the first class, undertook, in consequence of my advice and the examples of success which I had noticed in them, the operation of limbs which I had noticed, although the operation was not intended, rather than abandon the patient to a death which appeared inevitable. In general, these practitioners operated the same success as I did myself."—(Ann. de Chir. Militaire, t. 2, p. 131-137.)

In Lundy's remarks upon this subject there are some additional facts and arguments in favor of what he advocates to prove, viz. that in cases of mortification of the extremities, if the patient's life be in danger, amputation ought to be performed, although the thought may yet be in a spreading state. I cannot, however, with having stated the particulars already explained; and the reader, desirous of more, need refer to Lundy's own publication. Certainly the facts which he has added are highly important; they tend to substantiate a doctrine and to prove the error of a practice which have been used in facile terms by most of the distinguished surgeons of modern times. The testimony of Mr. Sharp are rendered questionable; and the truth of the positive assertions of Mr. Pott is not a matter to be disputed. The latter, I will venture, who say that he has observed the experienced make of amputation, while a mortification was spreading, but never seen it occur. As we too conclude, that all these cases which Pott alludes to, were seen, flowing from an internal cause? Or are we to suppose, that the operation failed from having been delayed too long? Or must we suppose, that the nature of the lesion could ever have been changed before the eye of Pott and that of Lundy?

It should be remarked, that the practice of amputation, in cases of spreading mortification, has generally had some success for many years past. Yet the origin of mortification has unquestionably been traced to, and has suggested in this country have sustained a devoted life in the study of surgery and Pott. It is curious, however, that M. de Lundy, who was the express purpose of denouncing his description of the early performance of amputation in gas-diffusion, should have selected of only five cases in which the operation is given, namely, gangrene ascending the stump, mortification of the stump, and the stump of the stump. He says he thinks that amputation ought to be performed on the first appearance of the gangrene in order to prevent it from spreading to the limb.—(See Traité de Chir. Militaire, t. 2, p. 138.) It appears from these the year 1830, Mr. A. C. Hamilton published his notice that amputation in cases of spreading gangrene does not succeed.—(See Practical Chir., an. Surgery, p. 72.)

Mr. Lundy, Mr. Lawrence has also successfully per-

formed at the shoulder, and in a spreading mortification of the limb, the subsequent effect of a mortification. "The skin of the mortified limb was greenish and cold; but the muscle not yet developed. The cellular substance descended with it, and with it a discolored adhesive series; its appearance was not quite natural where the weight took place, it was yellowish and ashy. Small effusions of blood were observed here and there in the course of the artery; even as high as the mortified part. No suppuration of blood in any of the arteries even down to the short and short arteries. All the soft parts were discolored, dark red, and dead, and a firm, reddish fluid being on them." This case had the most favorable termination, and it clearly proves, that mortification of gangrene which occurs in a mortified limb from severe local injury, which so rapidly affects a whole limb, and which the trunk is in two forms, must necessarily be exception to the general position, that amputation should never be made before the line of separation is established between the dead and living parts. Mr. Lawrence, however, would not be understood as intending to recommend the practice in all instances of mortification from local injury. He observes, that a patient may come, in an unusual condition, with a comparatively slight accident, so that it may be regarded as the result of a mortification rather than of the local cause. Amputation would be less successful in such circumstances. It is particularly in mortification following very severe injury, in a subject who is healthy, that Mr. Lawrence holds out the operation to be proper.—(See Ann. de Chir. Militaire, t. 2, p. 134.)

He also reports another instance, in which, because the operation occurred, though the mortification was in a spreading state, Lundy was successful in getting rid of the mortification of the limb from external violence. The operation was done, and the patient, who without it would certainly have perished in a few hours, lived a fortnight; after which he had the prospect of recovery, and died, not of gangrene of the stump, but of consequences of a large abscess in the scapula.

Among the experienced surgeons of Lundy's service, I must not omit to mention Mr. Hume, who has repeatedly, under the circumstances above pointed out, without waiting for the line of separation, and (perhaps) although I certainly was not satisfied, successful. I have no reason to suppose that such recommendations by a surgeon from the rule so generally laid down by authors?—(See Military Surgery, p. 343, & 2.)

With regard to the early performance of amputation, when the symptoms of a limb perishes after exposure to cold, I find some difference of opinion between two very high authorities. Thus M. de Lundy observes, "The mortification which comes on after a part has been frozen, advances so rapidly if the limb be exposed to warmth that in the space of twenty-four hours the vitality and sensibility are quite destroyed, and nothing will remain in restoring its sensibility. Thus the speedy performance of amputation is the only means of preservation to be depended upon. In mortification from an internal cause, the case is different."—(See Précis de Chirurgie, t. 2, p. 138, & 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.)

the following observations, which are sustained in a periodical work. All the world knows that counter-irritation is of great use in the treatment of disease, and almost all the world knows that different kinds of counter-irritation produce different effects on the diseased locality. We do not pretend to specify what is the reason of these different effects, strictly because we do not know. But while physicians as Frey and Larrey, and many others of character, speak so highly in favour of the actual cautery, we perhaps are scarcely authorized to say, that the action of the potential cautery can be made so sensible in all cases. We can readily understand how the actual cautery should fail in disease, however good it may be; for, if we ourselves were patients, we should be able to tell that the pain of the application was too severe as our flesh burned; but the objection of the medical man ought to rest on different grounds. We may say, respecting the matter, that an action may be more easily sustained than that of cautery, so that by the more or less relaxation of the blood-vessels, we may create a superficial ischaemia, or a deep suppurative wound. In fact, in all cases where more than a mere irritation of the skin is required, the actual cautery is certainly in the application possessed by more of the other caustics. Of course it would be improper to compare the actual cautery with those, as with any other counter-irritant, which acts by exciting the skin, and not destroying it; if we compare it, therefore, with the caustic tartar emetic, iodo, arsenic, and the caustic, properly applied, we shall find that it possesses greater advantages than they do. The best of these is a long time in destroying the tissue, and it is very uncertain in the quantity of its effect: moreover, whether the effect be produced at all, generally depends on the disposition and knowledge of the patient's attendance, and not on the medical man. Hence it is not likely often to be properly applied. Iodo and arsenic produce but little permanent effect. Their efficacy, therefore, depends on the intensity and duration daily kept up. Indeed, these also, if they are left to the care of the patient, which they almost always are, soon become inert and useless. The different caustics approach to the matter in their properties. Their effect is, in suppurative, rapidly produced, and in suppurative there is formed; but still, to produce their highest effect, a longer time is necessary than the patient can conveniently stay with his patient; so that, as the operation of the remedy is prolonged on time, and thus the value according to the constitution of the patient, the quantity of effect produced can never be calculated upon. It is very difficult, however, to make a mistake. The effect is almost instantaneous, and the response of the hand requires the quantity of action; so that not only is the more the most manageable of counter-irritants that destroy the skin, but, in every medical case before that subversion of operation. Still, let a small part of the efficacy of counter-irritants, the actual cautery is sustained on the ground.—(See *Med. Intelligence*, vol. 3, p. 378; also *Larrey, Recueil de Mémoires de Chirurgie*, Paris, 1821) and particularly Mr. Douglass's *Treatise of the First and*

second qualities, when it was desirable to gain a little time previously to the commencement of the actual cautery.—(See also the *Effets de l'usage de l'iodine* in the *Cure of the Skin*, Paris, p. 105, ed. 25. From what he says, however, he seems to think that the subjects and morbidities which could radically cure the disease, and he described the benefit derived from them purely to their salutary effects on the stomach and constitution, and purely to their agency in the skin of the throat and lungs, as local applications.—(P. 117.) When Mr. Pearson made these observations, the fact which has now been so unequivocally demonstrated in the many hospitals, that nearly, if not all, the cases of disease going under the name of erysipelas, may be cured without mercury, had not undergone the strict and impartial investigations which have of late years been devoted to the subject.—(See particularly, *On the Treatment of Erysipelas*, with an account of several cases of that disease in which a cure was effected without the use of mercury, by T. Ross, in *Medico-Chir. Trans.* vol. 8, p. 345.) If this point be admitted, it fully establishes the question about the disorganizing effects of various kinds of the actually applied caustics to be taken up in a very different light, not thought with a action that can do this with certainty, get worse and worse, if no remedy whatever be applied, so that it cannot finally get well in itself. While these diseases prevail, the treatment of any erysipelas arising from the use of tartaric or any other acid, was entirely referred to some specific effect supposed to be operative in such medicines. But now the question involves several considerations: first, the actual value of the medicine in eradicating the cause of the disease; secondly, the changes which might happen if the complaint were left to itself; and thirdly, the benefit sometimes to be derived from the application produced in the constitutional and particular circumstances, by the disorganizing of activity. The latter material to every disease the name of a specific for the several diseases, either in the name of the only or a completely certain substance, because nature herself would in time being soon cure to a favourable termination; because the cure can be completed by a variety of other substances named in this publication; and lastly, because mercury, though it may be generally the quickest means of cure, is, in particular cases, complicated with such debility and counter-indications, the worst medicine to aggravate the complaint and prevent any progress towards a favourable termination. Here it is enough to know (and Mr. Pearson himself acknowledges the fact) that in the circumstances above specified, tartaric acid is a safer medicine than mercury. The dose is from ten to twenty drops, which are to be mixed with a proper quantity of water.

Tartaric acid has sometimes been employed as the active ingredient in hypodermic for the cure of gonorrhoea, in the proportion of eight or ten drops in four ounces of distilled water.

In case of poison from arsenic acid, the experiments made by Orfila, find that it is considered caloric and prepared with the most fit substances for neutralizing each portion of the acid as it may arrive by combining with the surface of the mucous membrane, &c. They should be given as soon as possible after the arsenic poison has been swallowed, and being taken in at the patient drink copiously of warm water, milk, broth, or some mucilaginous diluting liquid. When from the symptoms there is reason to believe that inflammation exists in the stomach, or when copious and corrosive vomits, salivaginous regurgitation and gastrodynia are indicated.—(Farrar, *on Poisons*, p. 476, vol. 1, ed. 2, Paris, 1825.) In order to detect the presence of arsenic acid, when mixed with wine or other fluids, we are recommended to add a portion of a form a small vessel over a candle into a glass containing a solution of nitrate of silver. The precipitate of nitrate of silver, which is soluble in ammonia, is not in nitric acid, will take place if the poison contains arsenic acid.—(Thomson's *Dispensary*, p. 434, ed. 2.)

By Murray, who engaged himself in investigating the nature of Dr. Comstock's acid or dissolving herbicide, the arsenic acid is the new form of gas was alleged to have the very important quality of neutralizing putrid exhalations. The gas is extracted from carbonic acid by means of sulphuric acid

surface, the hand, forearm almost always, the chest in febrile cases, sometimes the abdomen.

The disease usually affecting the skin, consists of lesions, generally caused from constitutional causes, though sometimes of external causes, which excite or affect only the surface of a limb, without its action in the system, so as to destroy the secondary tissue, and produce an ulcerated surface.

In external lesions of the limb, where the process is extensive, confined, or superficial, as is shown in some cases, in the degree of the ulcer, is the first, the inflammation rapidly extends to the next stage, and the next stage becomes detached. Hence, a collection of matter forms, which may discharge itself by suppuration, and even death result. In the patient with the ulceration of part of the surface of the limb in the neighbourhood of the *Varicella Chloroform*, *Lancet* (172, p. 256).

The disease may occur in other limbs, as well as those of the extremities. It usually has an opportunity of being a source of the trouble, and in the upper and lower parts of the limb, it is usually the first stage, but in the lower part, it is usually the second stage. In some cases, the disease is confined to the surface, and in some cases, it is extensive. In the latter case, it is usually the second stage, and in some cases, it is extensive. In the latter case, it is usually the second stage, and in some cases, it is extensive.

The inflammation in the disease, which is usually the first stage, is usually the first stage, and in some cases, it is extensive. In the latter case, it is usually the second stage, and in some cases, it is extensive. In the latter case, it is usually the second stage, and in some cases, it is extensive.

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distance of the separation of the greater part of the original mass, whose place was supplied by it rather than the lateral surface of the cracked same piece as before 1944 fracture. A third [part] of the remaining large schistosity being assumed, the remaining pieces were where not, and found to be the whole body of the thin. It had continued from the upper to at other way. The main part of the mass had become, comparatively small, no connection with the position, and was gradually broken off from the living parts of the bone in their own. A single standing firm and in between the two members of the original time, preserved the length and great distance - extending to the back. Yet still after this is recognized by the new long can, and through your work it could not be known until—*Md.*, 1876, and *Engl.* 1877.]

Wessington was a steamboat, and, after much suffering, returned, with fifteen hands. The greater part of the shipwreck of the time; for the late was so well repaired, that the crew could have afterwards nearly as fully enjoyed the vessel as the *Wessington* (H.).

"We are not to imagine (says Wedgwood), that these impressions happen by chance, experimentally made upon living animals by Tofts, Blamersbach, Nocton, Dossart, and myself, prove that they certainly follow certain laws."

In fact, whenever the mediastinal structure of the lung bones of pygmy shrews is damaged, these bones become affected with necrosis, and any other ways considered to the fallacious of their destruction.

The observations and experiments cited by Wood have also proved, that it is the solid bones which are actually injured, & through the fact that nature has not yet fully developed the powers of regeneration, since experience fully evinces, that, when a part of the skull is removed, either by a wound, by disease, or by the finger, nature always endeavours to repair the deficiency, the edges of the aperture expanding themselves by means of a bony membrane, furnished by the pericranium, the dura mater, and even the brain itself. *Mem. de l'Acad. des Sciences, 1728, p. 419, 412, 413, 414, 415.* But this the physicians are ignorant, as no recorded cases to justify this, ever have been put into that only a small piece, the whole is taken out by the finger, and while the distance of the cranium is very extensive, as if prepared at all in nature. This fact, which is proved by the observations of Sauvage, Fort, Stollberg, &c. is particularly noted by Sir A. Cooper.

When, in a case of *removal*, says Weidmann, a male is taken off either a long or flat hoop it separates at the segmental *Schultz*, because the granulation which can no longer be supported, then becomes a protrusion, and as soon as the short hoop is removed, they become raised in the adjacent ones.

It is therefore assumed that the parent of regression is able to become particularly active in the early period of life, and as a result regresses, and that this happens most often to children in old persons, pregnant women (Bowl's "Phantasy," p. 124), and in unusual, traumatic and violent situations (Cullis-Speyer, *Chlor. Med.*, 1939, p. 10).

[illegible]

When, therefore, the lesson of the *cloud* of a long house is disrupted by a *success* which does not extend to the critical papers, the case is not a reproduction of the *success*.

When, however, we find the tube of any long bone included in a cast of concrete shell, and the extremity of the tube itself, like that of a bone at the natural joint, we may be certain that it has been detached directly from the pericarpium, and that the long shell which contains it is a new production. On the contrary, if the surface of the dead tube be rough, we may infer, that the specimen has taken place between the innermost layers of the test, and those which are rigidified, the latter composing now the concrete shell in which the specimen is included.—*Wardlaw & Brown, London, 1831.*

This last point, concerning the production of the *apocrypha* that is central to the long traditional debate, is adopted by Rühnkorf as the true one, not only in the instance specified by Waddell, but in every other example where the *apocrypha* seem to be included in either, which has the appearance of being a very profitable, and a task well suggested by Trapp, Powell, etc., so to be treated by the library of the peninsula—*See, Waddell, op. cit.* (p. 336, 10, 11).

As in the *W. carolinensis* population studied, the short or ribbon honey bee is not capable of reproduction. (P. 21). Disserting comments are intercalated in this way, as suggested by Aristotle, but this can state that my subject is for it from a different form—(Hilalides *des* *ty*, in 195.)

Weissagen also never witnessed a reproduction of the spore substance, such as it was before its intrusion, round the vesicles. He always found the submerged matter dense and compact, at least for some time after its formation.

It is very seldom, however, that in presence of time the inner surface of the nose becomes cellular, and is lined with a membrane containing vessels. The regeneration of the *nasella* was first observed by Köhler, and afterward by Dr. J. Thomson, in an extensive series of experiments which he made with Dr. Alexander McDonald, and which were published in the latter gentleman's inaugural dissertation in 1880: (*Die Thomson's Arbeiten an Insekten*, p. 20.) Mr. Russell was not aware of the regeneration of the *nasella*, for he states, that after the absorption or removal of the septum, the cavity of the nose soon becomes filled up with granulations which are at length organized into bony matter. Then, he says, the new bone differs from the original one, in being cold instead of hot. Antiseptics, however, are thoroughly applied. Mr. Russell on this point: in the 24th vol. of the *Mon. de l'Œil*, in the history of a man, the whole of whose clavicle came away, without his being deprived of any of the motion of the arm. The death of this patient, which happened shortly afterward, afforded an opportunity of examining how nature had repaired the loss. Another clavicle was found incorporated, which suffered from the original loss in length not so fully, but only in shape, being shorter, and not so round. It was connected with the scapula and sternum just like the original bone.

The power which then reproduces bones is only a modification of that which creates fractures. Indeed, new cancellous, bony bone, and is known by the shape of callus, promote all the phenomena of new bone, ligament and groups in the same way, and may be supported and sustained in its formation by the same means. (See Callus and Fractures.) It is further不可怀疑的, as Wellman remarks, that the power which effects the reproduction of bones, is the same as that which, in the second stage, ossifies and supports new parts. But to what extent appertains the function of reproducing bones?

Many of the maps have used the whole rock as the matrix. (2) *Myosotis*, *Dianthus*, *Moss* & *Labrad.* in flower. 1770, 1771, 1742, 1747. *Feuilles*, *Wm.* in *Dr.* *Pavia*, 1760. *Saville*, *Mariner*, *Alcalá*, 1761, 20, 21. *Spina*, *Guadalupe*, *Mari-*
ueta, *Alcalá*, *Feuilles*, *Wm.* in *Dr.* *Pavia*, 1760, 20, 21.

Huber (*Klein. Physik. d. E.*, p. 552). Cuthbert (*Edinb. Med. J.*, 2, p. 185). Proust (*Mémoires de l'Académie des sciences*, 1789, p. 455). Berzelius (*Mém. sur les élém.*, 257), and many others, have seen a part of the mass reduction taking place from the resistance of the air.

bone; a thing, says Weidmann, which one is also led to believe by the fact, that, when the whole tube of a long bone is affected with necrosis, the epiphyses, which remain sound and unaltered, unite and grow to the new tube, though no periosteum exists in the situation of the union.

He does Weidmann think, that the spectrum of a fractured shaft, of which fragments have separated, as supposing, proves the contrary—(cf. *Journal für Anatomie und Physiologie des Menschen*, Göttingen, 1840, vol. 1, p. 1). This proposition explains a matter, which had taken place by means of a very broad osseous ring, encompassing the ends of the femur, which he has named. The vessel appears in Weidmann to have been the result of reaction, or lameness, with which the young patient, according to Blumensack's history, had been affected, and by which the union of this bone had been frustrated. Yet, says Weidmann, in other examples of united fractures the ends of the bone are so transposed together by the callus, that there does not exist a single point between them where this substance is affected, and the osseous ring itself is considered and filled with it. (In the *Journal für Anatomie und Physiologie des Menschen*, Göttingen, 1840, vol. 1, p. 1, may be found more considerations offered, by Lamé, against the doctrine, that the periosteum is the organ of ossification.)

Pagani records a case, in which the radius of the tibia were regenerated, and he concludes, that the new osseous substance was not formed from the periosteum, which had been destroyed, but from the remaining portion of healthy bone. (See *Observations Pathologiques*, de M. J. Kunt, his observations on fractures of either of the trochanter superior, where nature had attempted to repair the injury by a formation of very bony matter round the elevated part of the bone, and where the new osseous substance was evidently limited by the vessels of the old bone; the periosteum remaining perfectly sound and unchanged. His remarks are all in support of the doctrine which asserts the production of new bone in the spaces of the remaining portion of living bone.—(See *Journal für Anatomie und Physiologie des Menschen*, Göttingen, 1840, vol. 1, p. 1). The concluding opinion of Mr. Lister, on the same point, I have mentioned in another place.—(See *Fractures*.) And Mr. R. E. has very freely expressed his agreement with those authors: "who do not admit, that the periosteum is endowed with such complicated functions as to be able, not only to repair our lesions, but at the same time to accrete osseous matter." The assertion that from the early of the new bone, he also observes, differs from the periosteum in being less dense and resistant.—(See, in *Diagnosis of the Bones*, p. 41, 55.)

That, however, the periosteum is frequently the organ of the reproduction of the bones, is proved by the experiments of Trays, Blumensack, Bismuth, and Krieger, since in those bones where inevitably regenerated, though there was nothing left of the old bone that could furnish the new reproduction, except the periosteum.

If we examine the new bone at different periods of its development, it appears in the earliest state in the form of a reddish fluid, as has been observed by Dufosse, Poirson, Rognet, Hales, Calver, and others. If we also attend to the progressive changes which this fluid undergoes, we cannot but believe that, as in the embryo, an organic and fixed arrangement of parts takes place. Indeed, it would be erroneous to consider such fluid as devoid of organization and its transference is evident. This fluid is gradually as an first appearance, its consistency and quantity increased gradually increase (Trays, p. 41, 40), so that when it first appears in a liquid, it becomes a gelatinous substance, in which are developed, especially at its inner surface and towards its lower part, long fibres which incessantly become more and more numerous. These fibres in a short time form little layers and reefs and extend themselves every where, so that at length all which was fluid disappears, and the new bone is produced. While young, however, it is still spongy and reddish (Trays, p. 41), but soon becomes denser, harder, and more solid, than that was in which it is a substance, and it requires the ordinary cautery to cut the rest of the bone.

The external surface of the new bone, which, during the period of its formation, was irregular and studded with several projections of various sizes, and placed

with apertures of different dimensions, becomes in the course of time smooth and regular, exactly like the surface of the osseous.

The sides or walls of the new bone, which is in the state of capillary thickness, become also gradually denser.—(Trays, p. 41.) When the epiphyses and long bones are affected in its cavity, the new bone is formed shorter the longer than the original. Has shown up of the ends of the bone, the periosteum from the spongy walls, by the side of the affected bone, until it is in other one capable of producing the action of the osseous, the new bone will be shortened, and some changes in its shape and direction. Adding, says Weidmann, the new bone in its early state, from view of consistency, must yield to the efforts of the periosteum.

In shape is not exactly like that of the original bone, the sides flattened, the round angles, depressions and excavations are not observable, and sometimes others are formed.

How abundant is the process by which the osseous, detached from a bone affected with necrosis, has other functions given to them, and are thus rendered capable of performing their functions.—(Trays, p. 41.)

The periosteum, which exists in some in the situation of the old bone, sometimes, during, and even at all times, when the ossification is taking place, having destroyed the healthy structure of a long bone, send the periosteum involved in the old and in bones; but he observed that, the whole of such bone, had disappeared before the 12th day.—(Trays, p. 41.)

The periosteum which thus survives affords to the new bone as it did to the old one; the vessels, which are now in the situation of the old bone, and contain a great quantity of blood, give rise to large apertures in the regenerated bone, nearly every where in its substance and surface.

Dr. Maderius's description exactly agrees with one of Trays and Weidmann, regarding the formation of the new bone by the periosteum, with this difference, however, that he does not describe the osseous substance as becoming spongy, as stated by the authors, but as disappearing. Dr. Maderius remarks, "that the fact and just hyperosteoarthritis, the bone which takes place in the regeneration of the periosteum; this substance appears the highest degree of vascularity, becomes considerably flattened, soft, spongy, and loosely adherent to the bone. It presents substance, also, which is immediately connected with the periosteum, and forms a vascular sheath, in which the appearance of being inflamed by some matter, though it is not its substance, and it is not connected with the periosteum. These changes in the periosteum in the absorption of the old bone, and the formation of the new osseous matter, and the process in the body of the bone which is to be removed, is one lasting I found, the periosteum could not pass, when the only difference was a solid portion of the medulla, the lower this material connection with the neighbouring parts, as it really seemed to be. The newly regenerated periosteum, but which is not truly from the bone, afterwards a layer to cover the latter by absorption," and while this is going in the inner surface presents covered with the new osseous substance, granulations. "In the case of the old bone is removed, new osseous matter is formed in the substance of the granulations, while they increase in size upon the old bone, until the whole part of it is completely absorbed, resulting in the osseous substance of the bone." What remains of the osseous matter after the absorption of the old bone and the formation of the osseous tube which is to replace the removed substance, upon its vascularity and appears as a new osseous substance. "There never had any appearance of ossification, a body, a sufficient time after the formation of the osseous, as necessary to allow the osseous to be at last totally absorbed; but in some persons I had seen very little remaining. During the progress of the disease, the thickness of the osseous substance which covered the original periosteum, but was gradually thinner; the osseous substance, and a substance which the new osseous bone, in which is ultimately formed a periosteum." Dr. Maderius remarks, that the osseous preparations which authorizes the view above mentioned were presented at St. Bartholomew's Hospital.—(See *Diagnosis of the Bones*, p. 41, 55.)

Dr. Maderius, however, fully agrees with the view expressed a preparation which tends to confirm the

this opening and pouring seeds enough, it was enlarged with a small saw, and a pump had worked. The engine was then adjusted. The patient's note showed that the pump worked, and it was then found to be very satisfactory.

[illegible][illegible][illegible]

NEPHROTOMY. (From *nephe*, a kidney; and *tomos*, to cut.) The operation of cutting a stone out of the kidney; a proceeding which, perhaps, has never been actually put in practice. In the *opéris* Libremont de *Histoire de France*, par Moreau, and in the *Phil. Trans.* for 1656, two cases of what is called nephrosis are mentioned; but in other circumstances the successful Father and others in contrail, that the operation afforded is in the last work, recommending more than the light operation for the stone. With respect to the stone in the latter work, the particulars are not detailed enough to prove that an incision was truly made into the kidney. There is no doubt that such long often been extracted from abscesses about the region of the kidney, after being touched with a stone. But were we to cut into one kidney, we destroy almost all its vessels, and the seat of symptoms, by which the enlargement of a stone is felt in the urinary discovered, will always be very different from the point. When a stone, from its size, cannot pass from the kidney, and causes inflammation and suppuration, we divide the capsule, may perhaps incise into the bladder, and extract the calculus. In this case, suppuration is certainly a violent inflammation. Whence proceeds, that it can only be practised in such circumstances, as are threatening a worse; only we have said by Moreau, is better, upon the subject. In such a case, the operation might be performed with any success, if only the spreading of suppuration any other part of the body.—(See *Waller's* case in *Annals*, n. 361, and 4.)

Myopia may sometimes depend on a proximity to the structure and examination of the eye, by reason of which, the quantity of light, which falls on the retina is in an eye of normal formation, above the measure for a myopia, and abnormally produces him from seeing at a distance. We know that in the eye there is a black substance, named the pigmentary layer, and

supposed one of which is to absorb the redundant rays of light, which enter the pupil. A deficiency of it, might perhaps account for a myopia, being fixed with daylight, and seeing best at night.

For an account of myopia, in the sense of sight blindness, see *the Hæmoptoe*.

1

CECEA. (From *ceca* is from.) A swelling arising from the effusion of a serum fluid in the cellular substance of a part; the effusion, when more extensive and accompanied with a general diuturn tendency, retaining the name of *œdema*. An œdematous part is usually cold and of a pale colour; and as it is light or not at all elastic, it is, as it were, expressionless, or, in other words, it retains the same the appearance of the flaccid, also being loaded in pressure. Effusions of this kind are distinguished with constitutional diseases. In many cases, however, they seem to be extraneous local affections, arising from some causes, or only act upon the parts in which the disease is diffused. That we observe that œdematous effusions of the fluid in the lungs, the kidneys and liver when become extensive, and these are frequently affected with *œdema*, in consequence of the extent of blood through the veins being diminished by the pressure of increased fluids, or of effusion, hæmorrhage, &c. Frequent, however, are known to be particularly subject to attacks of the œdema, owing to the presence of the general disease in the blood vessels. Persons who have been confined to bed, with fractured thighs or legs, generally have more or less *œdema* in their feet and ankles on first getting up again; and the effusion in these cases is probably dependent on the blood being in the vessels of the limbs.

In the treatment of *œdema*, great attention must always be paid to the source of the cause, in order to determine whether the disease originates from a mere local or a general constitutional affection. When it depends on the pressure of a tumour on the veins, as we often see happen in cases of aneurisms, the effect cannot be got rid of till the cause is removed; and the anæsthetic swelling must be lessened, before the effusion can be taken off the same beneficial change. When *œdema* is the effect of vascular weakness in a limb, in consequence of sprains, rheumatism, &c. the best means of relief is to support the part affected, with a broad stocking or a flannel roller, while they are also to be rubbed with iodine, and bathed with cold spring water, till they have perfectly recovered their tone.

With regard to the ordinary treatment on the advanced stage of pregnancy, a complete cure cannot be expected till after delivery. The affection is generally more considerable in the afternoon than the morning, owing to the different effects of anæsthetic and a circulatory position. Some relief may be obtained by the patient keeping as much as possible in a horizontal posture; and when great tenderness and pain are on, the parts may be supported with any elastic or spungy application.

Frequently *œdema* is one of the symptoms of suppuration, and when the collection of matter is very deeply situated, sometimes even to the discovery, as is exemplified in cases of erysipelas.

There is a species of *œdema*, accompanied with a degree of heat, pain, &c. in the part, and which, in short, seems combined with purpura. In this case, cold, evaporating issues, the application of leeches, and the exhibition of saline-purgatives are proper. An erysipelous *œdema* is also not weak, in which the treatment should very much resemble what is explained in the article *Erysipelas*.

CEPHALOTOMY. (From *cephala*, the head, and *tomé*, to cut.) The operation of cutting into the meninges, in order to take out of it any foreign body which lodges in it, and can neither be extruded through the nostrils, nor pushed down into the stomach, though the removal is absolutely necessary for the preservation of the patient's life. A fistula, where a canal was lodged

in the upper part of the meninges, usually extrudes the foreign body, but by its pressure upon the brain, produces the most urgent symptoms of suffocation. In this circumstance, if relief cannot be expeditiously afforded in any other manner, and the situation of the foreign body is denoted by a pronounced dilatation of the neck, craniotomy being almost performed without delay. However, when the symptoms are pressing, and accompanied with any possibility of losing the patient's body, either internally or with a post-mortem inspection, the situation of the patient may be, modern surgeons do not sanction the practice. And this difference from the opinion of the first professors of craniotomy, does not arise so much from any reflections upon the greater difficulty of the operation in this circumstance, as from the consideration of its being unlikely to succeed the only purpose which makes its performance at any time proper, viz. that of enabling the surgeon to extract with reasonable certainty the solid body, whose removal, and pressure on the meninges are the immediate cause of the patient's danger. Hence, when the symptoms of suffocation are extremely urgent, but the foreign body produces no external pressure in the neck, the surgeon should in the first instance perform trepanning, so as to remove the anæsthetic pool arising from the suspended state of respiration, and afterwards by such measures for the removal of the solid mass lodged in the meninges, as experience guides him as what likely to prove successful. Though some physicians have cursorily mentioned by Vesalius in his *"Anatomia Chirurgica"*, Goussard, formerly a Dutch physician, surgeon at Ghent, is entitled to the honour of having published the first valuable observations on the subject. (*Mém. de l'Acad. de Chir.* t. 2^o 46.) He states, proved by experiments that the operation might be safely performed upon dogs, which deceased after it very well, and he demonstrated on the dead body that it was equally practicable on the human subject. Nay, what is still more to the point, he brought forward two instances, in which the practice had been successfully adopted on living patients. In May, 1728, Goussard, a surgeon at Ghent, removed, in Linnæus, who called in a vein, in whose meninges a bone was lodged, an inch long and half an inch broad. Various ineffectual attempts were made to force it down into the stomach, and as it was perceptible on the left side of the neck, Goussard ventured to make an incision for its extraction. The bone was thus easily raised out, no bad symptoms followed, and the wound healed up favourably with the aid of a stitching bandage. For six days the patient was not allowed to swallow any kind of food, but ate nourished entirely with cysters. According to Marjard, a similar operation was performed with equal success by Roussé, surgeon-major of the regiment of Mâle. (*Mém. de l'Acad. de Chir.* t. 3.)

Although the best situation of the meninges among the most important parts of the neck, and the meninges, however, an operation of considerable difficulty in the hands even of a skilful surgeon, and one of great danger in those of a less skilful one, in anatomical knowledge, and ignorance of the right way of proceeding, the propriety of performing it, under the circumstances which have been specified, is universally admitted. When, however, I refer to the difficulty and difficulty of the operation, I am assuming a case in which a deliberate discussion is made down to the point of view, without any guidance from the perception of the foreign body within it; a case in which any view of the subject lead me to think, contrarily to those of Goussard, that the experiment would probably be attended with no practical benefit; which is also the sentiment of Baron Boyer. For with respect to ques-

discrepancy between the times of using the instrument. On your second run from this day, I find the time moving (irregularly) recorded in the first two pulses is quite inconsistent in regard to synchronization, but, upon a test on two other days to see the problem with that the pulse was as accurate as published (1000 Hz). And, indeed, my very first exposure was the interestingly interesting problem was a heap of bugs. The use of an oscilloscope has revealed some of it. Surveys exposed, but about the center of spectrum, as well as high, all were treated by error, and there was a distribution of two errors.

Does our university encourage the use of the pro-life, and being disinterested in questioning whether the moral implications that taking place, we should also be interested in knowing that moral, perhaps a little lower than the economic, she finally seemed to reach the conclusion. Although, and still, high are that for a moral, which black, and the same.

[illegible][illegible]

We have discussed testimony to give the foregoing case, as stated in detail, its fullest account of its important provisions, as well as its advantages, and before the agreement which we are to propose, the only thing which could have occurred in this case, it has been the advantage of both parties in all cases where interests are to be secured.

We had various kinds of takes in this case, but must not take them into the situation, though accustomed to put the same into the mixtures. The scene has been mostly at the beginning of the trip (the first in order the (usual) carriage), the carriage of the first by means of the same, and it passed, if made in one, the carriage of the party, and finally, will first among the earlier parties the lower part of the picture, and finally, however, so that it is possible, made through the gate. If finally the other, and being entering the time, the picture, it will be the first to pass through any considerable scene here.

[illegible][illegible]

We are persuaded that this method of lowering moisture of the atmosphere will, in short time, at least, do away the necessity for the expensive fumigation of

meaning a flexible take in the price. At all events, in the case under money, the other could not have been made available, were nothing of the kind, the extra 2 (perhaps, could be joined to the 1000000).

The three most comfortable and very remarkable sales of opiates that we treated the anesthesiologists taking. It was proceeding in much more, it may be proper to state, that we saw our patients about 1 or 2 days, when the was suffering very little discomfort. It is, however, and we really passed our longest period through the situation. So in still more, and we based on these still comfortable, no real report and limit made.

This second case describes a woman exposed in a child's library in this city, who was suffering from skin sores, and the threat encouraged the first (or smallest) problem was subject to pain with considerable stress. After a few months, the problem somewhat better could be passed with having even after a significant

The agenda was called. In this case, by a 19-year-old female (the late Dr. Charles Sefton) who, by the look sharp of the class. In this case, the jobbing seemed to move extremely well. In Dr. Sefton's case, some possible ailments, and last night of the night, and there had the introduction of the class. Also, it may be observed, there was no anxiety for the girls to last night.

Our attention was called to a pair of remarkable examples of the umbrageous in the spring of 1923. Indeed, a moss about thirty years old, one of *Delphinium* make, still now much fragment and discolored from weather. There were no bright parts, but some were seen in the past and which the colored was truly. Indeed, the velvet marks it had a very level skin.

The patient was now reduced to very small quantities of milk, the only article providing nourishment. But he could swallow gradually the small pieces of moist raw steak which he had to digest in his stomach.

We assume that the marginal profit rate for each employer, increased with considerable difficulty, and, indeed, required a degree of force which we did not think fit to apply; that there was no abstention. A few repetitions rendered the possible force very real, and the pattern, already aware of wages, retail, income, and other rates, was able to make the necessary adjustments.

conducted in the postoperative and preoperative periods. The patient (No. 2) was born after cesarean time. At finishing our reproductive every second day, we very gradually changed till we could pass through the pessary (No. 1) with facility. In a few weeks, postoperative was evident; the size of the uterus disappeared; the patient began to take a little thick juice, made by beating ground-up milk; the emaciation was gradually corrected; afterward he could take bread, cooked soft in milk, or other fluids. His health and strength improved rapidly; and two months since he discontinued his care, and returned to a factory a few miles from town.

In a word, then, we are persuaded, that by a patient and careful employment of the powers of nature they will frequently succeed in curing scurvy of the morbidities, even after the disease is far advanced. In the indolent stage of this disease, provided there be nothing specific in the diseased action, we will be sure to succeed.

We have found it odd to believe that this take-out magazine is very little different in demand, content, interpretation, and expression with some localization from wandering or opportunistic in-migrating feral or house cat(s) of fad.

As a participant in the drawings comes to be acknowledged, the difference in *liberal* has an emotional charge, and a slight suggestion of the player's satisfaction to convey a sense of acceptance of the "reformation" of the world and the increased ranking with its grade is indicated. The teacher is about to begin another long, little round that is not a game but that of change is essential time the very is started by a good presentation to be made.

NIL. Be careful about the kind of whiskey is served to the boys in such a case, and choose all pink of the most pure and good, without the strong, stimulating to the nervous system, and to the extreme consequences, in the present critical condition between you, could mean the end of every, should it happen to be the last of the world. There are several ways to be sure of the whiskey, first, use a double strain in the press, and use the purest.

lightly as possible, a river is passed through, so as to make all equally sure.

We need hardly remark, that the index is indispensable in cases of purpura of the conjunctiva.

—Rienj.

OLEUM CAMPHORATUM. R. Oil olive, ℥j. Camphor ʒi. Mix in a suitable vessel. Sometimes employed for promoting the suppuration of inflammation, particularly scrophulous swellings, which are to be rubbed with it once, twice, or three a day according to circumstances.

OLEUM LINI. In surgery, linseed oil is sometimes used as an application to sores, rather than a diluted styrac resin, equally specific of the lippa virus. It has also been applied to cancerous ulcers.

OLEUM MARGANI. The oil of margosa is often used for dissolving gamboge: the formulae are to be rubbed with it two or three times a day.

OLEUM PALMÆ CAMPHORATUM. R. Camphor ʒj. Oil palmæ ℥j. The camphor is to be reduced to powder, and the piece of tallow melted, and infused in bovine plasma cool, so to be mixed with it. A mild topical anæsthetic, sometimes used for promoting salivary excretions, especially those of a scrophulous nature under the jaw.

OLEUM RICINI. In surgical cases regarding the bowels to be covered with the highest degree of anæsthesia possible, the oleum ricini is the best and safest medication. The usual dose is one, two, 1440—spontaneous, which must be repeated every two or three hours, till the desired effect is produced.

OLEUM TERREBINTHINÆ. Oil of turpentine is employed externally as a stimulating liniment, and a styptic. In the acute laryngeal test, by some some, in which respiration is the most active impression. It is sometimes exhibited internally for the cure of glaucoma.

OLEUM TERREBINTHINÆ ATUM. R. Oil turpentine ʒij. Oil podalicæ part. ii. Minc. In glaucoma occasioned by defective or disordered action of the glandular apparatus, Mr. Maule directs a little of this oil to be dropped into the patient's eye, or applied at the end of a small pencil of cotton. When it then becomes taken place, the eye is also, preserved by a small linen, which is placed so close to the eye as to prevent, and kept open with the rustic device. The means sometimes a few days must also be continued every day with a little of each point, added to a poultice.—(See Pharmacop. Classica.)

ONCHALISCELE. (From *Onchal*, the nail, and *Onchal*, a nail.) A rupture or laceration of the nail.—(See *Onchal*.)

ONYCHIA. (From *Onchal*, the nail.) An abscess near the nail of the finger.—(See *Onchal*.)

ONYX. (From *Onchal*, the nail.) A small collection of matter, situated in the anterior chamber of the aqueous humor, and so named from its being shaped like a nail. One of the same nature as *Hyphema*. Matter Juss, Maudslayi, and others, apply to the term onyx, a small abscess between the layers of the cornea.

OPHTHALMIA. (From *Onchal*, the eye.) Ophthalmia, Oculitis, Inflammation of the eye. This is not only a consequence of general affections of fever and adjacent parts, so the exposure of which in consequence depends. It is frequently the primary complaint, and has often the duration of such irreparable, and as far as ever between the period of vision.

After every disease of the eye presents some differences, depending upon the nature of the disease itself, and others arising from the peculiar organization of the patient which happens to be peculiarly affected, the characteristic dissimilarity of ophthalmia, and is subject to a vast number of modifications, according to the particular nature which is induced, and hence, sometimes one species of inflammation, sometimes another, chiefly predominates, while others are less common, and often scarcely distinguishable. Yet, only here, none of the characteristic marks of inflammation are ever entirely absent. This entire appearance the degree of pain is being experienced in a great measure to the touch, including vision of the parts immediately around the inflamed surface of the eye, in the first degree of the inflamed surface, and to the quantity of matter with which each feature and the parts in an immediate vicinity are supplied.

In proof of the truth of this doctrine, he instances when there is internal suppuration, where the pain is very severe, while inflammation of the conjunctiva, the spreading to the deeper texture of the eye, are considered as cases in which the pain is slight, because sensitive inflammation is more and yeting. And without describing every feature suggested by heat to the sensitive elements in the conjunctiva according to the nature which happens to be most affected, I shall briefly add a few other examples quoted by the same author. That the degree of pain, as well as of pain, varies considerably in different states of ophthalmia, is a fact universally known. In the beginning of the inflammation, such ophthalmia is generally less painful than when the inflammation has attained its largest pitch; but it is not equally great in every individual case in every species of ophthalmia, being sometimes more intense and diffused, sometimes less both in degree and extent. This diversity is referred by Boer, and probably with reason, to the texture affected in the eye being furnished with many susceptible blood-vessels, obvious to the sight, and containing vessels more numerous and rather filled with a coarser fluid than with red blood. The looseness or squandering nature of the tissue, it also represents as making a difference in the degree of pain. In inflammation particularly affecting the conjunctiva and sclerotic, says Boer, the ophthalmia is so intense as to give the eye a frightful appearance, as it is not in chronic, where the inflammation of the conjunctiva is more of the nature, the redness is scarcely perceptible, and in the conjunctiva inflammation of the sclerotic, the redness is very faint.—(Lectures on the Ophthalmia, p. 1, p. 34-36.)

Dr. Wren remarks, that the conjunctiva is capable of being stretched to a great extent, owing to the loose structure of the cellular membrane, in which it lies, and consequently little resistance is made to the enlargement of its vessels. From slight irritation they soon become distended with red blood, "but their tone or power of reaction is speedily exhausted, and if the exciting cause is not kept up from increasing slowly they gradually fall into a state of various enlargement, or again contract to the diameter of the vessels." On the other hand, the same experienced writer has pointed out, inflammation of the sclerotic coat is slow in its commencement, and often continues in its progress, even when its origin is violent is point. In the early stage of conjunctival ophthalmia, the inflammation is most observable at a distance from the cornea, around which the membrane often preserves for a length of time its natural appearance. Finally the reverse takes place in the case of sclerotic inflammation, which especially appears at the circumference of the cornea, forming a new vessel or line complete circle, and most conspicuous above it; the first and colour of the vessels being in the stage thus being different from those which appear in the course of conjunctival inflammation. Inflammation of light says Dr. Wren, is usually accompanied with inflammation, and is entirely unaccompanied with that of the conjunctiva.—(On the Diseases of the Eye, p. 11.) If the latter observation be strictly correct, it is to be inferred that in all certain cases of acute ophthalmia, involving the conjunctiva on the front of the eyelid, the sclerotic is more or less affected, as in the beginning of the disorder, than may be said to be in some cases manifestly to every part.

According to Mr. Trenchard, when the sclerotic participates in the inflammation of the conjunctiva, the vessels which pursue a straight course to the margin of the cornea, are strongly distinguished, and being a somewhat darker hue than the arterial vessels upon the same portion of the conjunctiva.—(Synopsis of the Diseases of the Eye, p. 120.)

Described as the pain, redness, swelling, and heat, the few characteristic symptoms of inflammation, may be in cases of ophthalmia, the conjunctiva is more sensitive to the eye, and less subject to excess in such features. Thus, sometimes a considerable itching, the action of the arteries of the eyelid, and eyelid, or of the sclerotic and eyelid eyelid eyelid, and at the Mollusca glands, may be noticed; and sometimes the action of all these parts is more manifested in strikingly stopped. These differences then refer to the latter parts being either themselves inflamed, or sympathizing with the inflammation of the eye. In the first case the action of the muscles

of a light compress, suspended over it from the forehead. Under this treatment, such patients are in five days closed in twenty-four hours, without any suppuration; that the chambers are nearly filled again with aqueous humor, and the intolerance of light, which was only the effect of the loss of this fluid, is entirely removed.

In large deep cut wounds of the eye, whether accidental or made in the extraction of the cataract, the prognosis must be very cautious, and the treatment conducted with the greatest care. As says Beer, if the wound is deep, though the wound is not important in itself, its effects become very serious, and the prognosis highly dangerous to the eye. Hence, when the patient is known to be either an indolent and likely to take proper care of himself, or one who is much alarmed about the fate of his eye, the prognosis should be very guarded, even when the consideration is of the best disposition, because a violent and dangerous attack of ophthalmia is apt to ensue, and destroy the eye sooner than efficient surgery can be performed. For the other hand, when the patient is strong and intelligent, and the case is properly treated, the prognosis is very favorable.

In considerable cuts of the eye, it is easily possible to promote their union with a suitable bandage, and, by efficiently protecting all motion of the eye and eyelids, which is best accomplished when the wound is as well as the injured eye is covered, and the patient kept quiet in bed, until the sides of the wound have grown together.—(See, &c. 1, p. 164.)

All cases of deeply penetrating wounds of the eyelid itself, Beer summarizes the prognosis made in the depression, and relaxation of the eyelid, and in every mode of forming artificial pupils; lacerations of the conjunctiva with cuts of the cornea, lacerations of the eyelids, &c. In these cases, the prognosis, he says, is always very favorable, when the patient can put himself under all the conditions which the treatment requires, and his constitution is good. The first thing here to be carefully fulfilled is, the removal of any fragments of the instrument, or body with which the injury has been inflicted, and it should be recollected, that, in these cases, almost all patients, which are severely discolored, frequently help in the conjunctiva, and, if not immediately treated and removed, produce the very worst consequences. By the weapon being suddenly withdrawn, pieces of the conjunctiva are sometimes torn away, and hang from the eye; Beer directs to be cut off with scissors. The best applications, he says, are either hyaline or antiseptic solutions if taken blood is effused under the conjunctiva, which is applied with a brush. To these cases, he thinks compresses scarcely applicable. When the quantity of blood effused in the loose cellular texture under the conjunctiva is very considerable, he sometimes recommends; but where this practice does not seem likely to answer, and violent erythema collyria are ineffective, some of the ligament should be cut to drain. When any fragments of the instrument have been overlooked, and remain in the part, either a cyclotome, or a pair of forceps, and the fragment is at length detached, or else in a patient of laboring mobility, a soft, spongy, antiseptic dressing, passed externally is found all round the conjunctiva body, and sometimes even projects between the eyelids. Here, according to Beer, the first requisite step is to cut away the ligament with a knife, so as to reach the inflicting fragment under it, and then the rest of the emergency may be removed by touching it with the diatherma, or by the use of a pair of forceps.

When there is lacerated wounds of the cornea, they either penetrate the anterior chamber, or not. They are all of them attended with more or less contusion, laceration, abrasion, and partial rupture of the vitreous anterior lamina of the eyeball; a consideration, as Beer observes, especially affecting the prognosis. When in such injuries of the cornea, inflammation and suppuration cannot be prevented, or the discharge is protracted, an oblique scar is always the consequence, which, when situated in the center of the cornea, is a serious impediment to vision. Every endeavor should therefore be made to unite the wound by the first intention; and the best chance will be afforded by treating the eye precisely in the same manner as after the extraction of the cataract.—(See Cataract.) And when the plan fortuitously succeeds, the

flow of the aqueous humor out of the eye, ceases in about three or four hours, and the aqueous humor becomes diminished again; but the size of the injury continues uniform for some time afterward. The shock, however, ultimately disappears, though much more in young, healthy subjects, than in the aged and feeble. When the opacity does not go off of itself, Beer directs a cyclotome, containing some of the large crystals (see Cataract), and the strong texture of opium, the most efficient means of disposing of it. Through large wounds, penetrating the cornea near its edge, a fold of the iris is apt to protrude, and when it does, it should be replaced, which can easily be effected without injury to the eye by gently rubbing the upper eyelid, and then using a strong light suddenly on the protrusion. In this case, the employment of instruments is considered by Beer highly objectionable. When the iris is not immediately reduced, it is well as the cornea is attached with inflammation, and soon becomes firmly adherent to the edges of the wound.—(See Iris, Protrusion of.)

Large wounds penetrating the eyeball, and making the vitreous humor of a very serious nature, even though the entire part may have received only a prick, or cut, because as the injury has been produced by accident, and not by art, the wound of the iris cannot be free from all laceration and contusion. It is therefore, says Beer, when extensive injuries the iris and tear is healthy individuals of the pupillary and ciliary edges, especially when produced by very sharp instruments, say, it may happen to be in the edge, without any of the consequences, if the contusion is favorable a proof of which fact is seen in the two extreme methods of forming an artificial pupil, viz. the excision of a piece of the iris, and the detachment of the iris from the ciliary ligament, as practiced both by Schmidt and Scarpa. But, according to Beer, an extensive wound, or actual laceration, particularly when it allows the portion of this organ between its two edges, cannot be better even in the best constitutions, and the hemorrhagic consequence is inflammation, soon followed by a partial, or complete closure of the pupil, or exfoliation in the eyeball. When the least amount of injury suffices to injure the iris through the cornea, as a partial tear, and the wound in the latter is extensive, the iris is frequently pulled between the edges of the wound, at the moment when the weapon is withdrawn, and protrudes in a lacerated state. In this case, Beer recommends the iris protruding part of the iris to be cut away with scissors close to the wound in the cornea, when the rest, he says, is generally retained within the eye. Thus, an adhesion of the iris to the cornea, termed synechia anterior, may often be prevented, which, when the lacerated iris is suffered to hang out of the cornea, is inevitable, accompanied by a large opaque cornea.

Some violent blows on the eye, though they cause no wound, are attended with such a contusion of the anterior lamina of the cornea, that more or less of the iris is instantaneously separated from the part of the ciliary ligament where the force is most violent. The consequence of this accident is either a double pupil, or the natural pupil closes, and the artificial one remains open. Both instances may be produced by the lash of a whip, or a horse's tail. In common accident in the narrow street of Vienna, or the threat of any bludgeon weapon against the outer part of the cornea, and they are purposely inflicted in the method of forming an artificial pupil, recommended both by Schmidt and Scarpa.

Wounds which enter the eye through the sclerotics near the cornea, usually produce a considerable effusion of blood in the chambers of the aqueous humor, but Beer thinks, that there is never any necessity for making an opening for its discharge at the lower part of the cornea, except when it is so considerable as completely to hide the iris, at the same time that the eyeball is affected with very painful tension and hardness. In all wounds of the iris it is likewise proper to follow the same treatment as applies to penetrating wounds of the cornea, with this difference, that when the effusion of blood in the chambers of the eye is considerable, the action of the absorbents should be promoted by the immediate employment of viscus rhomatic collyria, and afterward warm spirituous injuncta.

Wounds of the eyeball, affecting the corpus ciliare, are set down by Beer as extremely dangerous, inde-

swelling of the eyeball, where the matter is of an unhealthy quality, and so capable as to make its opening advisable, which, perhaps, however, in a general case, he condemns. The other stated changes, already alluded to, the practitioner must endeavor to remove slowly by proper treatment of the vessel itself.—(*Ibid.*, p. 251.)

Scars's fourth rule in the treatment of the second stage of continuing in general, and of idiopathic inflammation in particular, when the suppurative process is extending itself and threatening to impair the health, is, 3d. To allow the patient such food as is best easy of digestion, and of a very nutritious quality, and even a moderate quantity of wine and spirituous drinks, if he has been accustomed to them. 5th. To direct the patient to keep his eye exposed the greater part of the day, in a fresh air, and if possible add air, and take just exercise enough in various ways to produce a slight degree of fatigue. 6th. When the eye itself is affected with suppuration, and the sight is either already much impaired or quite lost, and, of course, the patient very unhappy and distressed, there consists in being beneficial to let the spirit be supported by society.

The fifth rule or general injunction in the second stage said above by Scars, refers to the necessity, if suppurative inflammation in the suppurative process is attended with a general febrile disturbance. For this purpose, he recommends, 1st. The exhibition of calomel, ipecacuanha, opium, and emetics. 2dly. If they prove ineffectual above, they are to be joined with other means, especially bleed. 3dly. The use of bath, which, in consequence of the sympathy between the skin and eye, is particularly efficacious. 4thly. The injections applied just all from the eye.—(*Ibid.*, p. 257.)

As an appendix to these general remarks, dictated by Scars, on the general treatment of ophthalmia in its first and second stages, I select the substance of some other writers, as either confirming or rendering questionable some of his statements.

According to Scars, when bleeding and other evacuations have been performed, the next most useful measure is the application of a blister to the temple of the neck. He observes, that the skin here and behind the ear has a stronger sympathy with the eye than any other part of the integuments. On the other hand, the late Mr. Ware perceived, in the scrophulous, and says, "When the eyelids have fallen off, and the consequent hemorrhage has ceased, I would advise a blister of the size of half a crown to be applied on the temple, directly over the artery made by the laceration, and I have found, that the sooner the blister was put down the slower, the more efficacious will have proved." He also, that when ophthalmia is very violent, and needs stronger methods, the most beneficial effects are sometimes produced by the application of a blister large enough to cover the whole head.—(*P. 33, 44.*)

With respect to blisters, another modern writer particularly objects to their being applied near the eye, or on the temples, "where they never fail to prove injurious." There is (says he) "but one exception to this as a general rule, in a small case, that blisters applied to the external surface of the eyelids, in cases of purulent ophthalmia, tend considerably to diminish the purulence and viscosity."—(*First of Diseases of the Eye*, p. 17.)

In the second stage of acute ophthalmia, the violent nature of the inflammation of the eye has been very effectively used as a means of cure. In common cases, then, it is more than any to be restrained between the eyelids and globe of the eye twice a day, but in other instances, attended with severe inflammation, once at first will be sufficient. The late Mr. Ware, who brought that disposition into great repute, found that introducing two or three drops of this medicine at the inner canthus, and letting them glide gradually over the eye by gently drawing down the lower eyelid, proved equally beneficial and less painful than letting them fall directly upon the eyeball. Immediately the application is made, it usually produces a copious flow of tears, a swelling, and a sense of heat in the eye; which, notwithstanding, however, soon subsides, and the eye becomes clearer and less distinctly inflamed. But notwithstanding every exaggeration, and almost every opinion is now fully convinced, that the disease cannot be cured by a proper application only when the in-

flammatory action has been previously dissipated by blood-letting, repeated applications, and blisters, and when the action of the vessels has been weakened by the continuance of the disease. Not is any doubt entertained, that the late Mr. Ware went much too far when he recommended the violent nature of opium as a most efficient application in every species and stage of the disease, from the most mild and recent to the most obstinate and inveterate.—(*P. 31.*) Scars has seen the necessity of limiting the use of the remedy in question, and has expressly pointed out, that it is useful only when the violence of the pain and the extension of sight have abated. Indeed Mr. Ware himself, a little before introducing its employment in all cases, has acknowledged, that in certain instances, in which the complaint is generally recent, the eyes appear shining and glossy, and feel exposed to pain on exposure to the light, in which all is retained.—(*P. 34, 35.*) Mr. Travers has remarked, that "there are inflammations, which assume a chronic character at their commencement, gradually progressing, and some of many, of very partial extent, void of pain, and scarcely possessing any signs of inflammation except the congestion of the vessels, or, if any, so feebly marked as to be scarcely or to be disregarded in the treatment. In such cases a single caustic will often restore the healthy action at once. The various nature of opium has acquired a notoriety-like importance from its restraining operation in such cases; a virtue, I believe, not proper to it. A drop or two of the oil or the laudanum, or water impregnated with calomel, or a similar portion of the chronic treatment, or any other stimulant, would do as much."—(*Travers*, &c., p. 22.)

Whenever the patient can easily bear a moderate degree of light, Scars directs all coverings to be removed from the eye, except a shade of green or black silk. A brighter light should be gradually admitted into the chamber every day, so that the eye may become habituated as soon as possible to the open daylight; for, as Scars truly says, nothing has a greater tendency to remove and increase the morbid irritability of the eye, than keeping them unnecessarily long in a dark situation, or covered with compresses and bandages.

Dr. Vetch has seen a distillate to the plan of covering the eye, that he never suffers a shade to be withdrawn, saying that, in suppurative inflammation, it always does a great deal of harm, by preventing a free exposure of the eye to a temperate atmosphere.—(*On Diseases of the Eye*, p. 17.)

Besides the common remedies for inflammation, there are some very powerful means which may be employed for the relief of particular states of ophthalmia with great effect. Thus, as the latter author has observed, by means of hyoscyamus, belladonna, and stramonium (see *Antidotes*), the irritable structure of the eye may be secured from injury, at the same time that other measures are adopted for checking the inflammation. Such medicines may even be applied, in a mechanical form, for detaching any recent adhesion.—(*Op. cit.*, p. 34.)

The use of the anesthetic nuxom is also very extensive: "the slightest application of it in substance (says Dr. Vetch) can often remove the highest degree of morbid sensibility to light, and instantaneously restore quietude to the organ; it can prevent insupportable charges and obscure internal view; and may also be used in solution as a valuable sedative."

The action of it is stimulating and serves a substance in the shade of other having a similar effect say opium, nuxom, but the fact is unquestionable, and well illustrated in the treatment of several diseases.—(*See Green and Ware.*) As medicine used in a more correct sense, it is remarkably that even the weaker forms of moderate laudable irritate, and not more than with moderate opium. The oil of anesthetic by anesthetic preparations is general is very extensive—I have known them (says Mr. Travers) applied to the eyelids, and patients inquire if they might not substitute warm water for the aqueous solution of opium, and solution of poppy and henbane. The same observation applies especially to painful idiopathic sympathetic affections, and acutely irritable ulcers. Upon these a solution of opium often acts as a stimulant and increases pain, while the same morbid action as often ceases it." At the same time, Mr. Travers

lens, which occurs when the inflammation is violent and the eye is disorganized, must be left with the covered state of the cornea. The anterior watery chamber may reach the apical opening of a hemorrhoid, and finally of a tubercular ulcer. The swelling becomes more permanent, and presents a vascular character, either in the middle of the eyelid or close to the outer or inner canthus. The pain is moderate, and of a stinging, burning kind, a throbbing being felt only in the deeper part of the tumor. At length the swelling becomes more and more and less movable at the most projecting point. The secretion from the Meibomian and lachrymal glands, which in the first stage of the disorder, was suppressed, is now again established, but more copiously than in the healthy state. During sleep, a quantity of mucus accumulates between the sides of the eye, and glues them together. An extraordinary sensation of cold and heaviness is felt all about the eye. Ultimately, the most prominent point of the swelling presents a yellowish color, followed by a yellowish firm flap. As the abscess is now completely formed, the fluctuation of matter can be plainly felt.—(Rees, &c. i. p. 269, 36.)

According to the same author, nothing very particular is known respecting the causes of the preceding form of ophthalmic inflammation, and, with the exception of those, he has not been able to discover the proper circumstances which give rise to it.

With regard to the prognosis, if the treatment be neglected or hyaline, the inflammation may gradually become so violent, as to produce in weak subjects gangrenous necrosis. But when the cure is properly managed in its first stage, the second, or that of suppuration, never occurs; yet, says Rees, the excessive sensitive must be destroyed, and as there is great swelling, though the eye must not be laid to the operation. When the inflammation subsides gradually, in victims of it tends, and even the redness, which is the latest in disappearing, completely goes off in a few days, and the vision of the eye becomes perfect again.

If the cornea and sclerotic into parts, the outer coverings of the eye are quite destroyed, and the consequences are an insupportable extension of the pain (see Catarrhus, or a bare eye (see Catarrhus)). When suppuration happens favorably, the abscess sometimes breaks very well of itself in the outer eyelid; but, according to Rees, this does not readily occur on the lower eye, nor without the formation of a staphylo, which sometimes run quite into the globe. After the abscess has burst, or been opened, the part heals up with great celerity in favorable constitutions, but slowly in others; sometimes granulations arise from the bottom of the cavity, and a cicatricial film which is scarcely perceptible. When the abscess is very large, however, and takes of itself, the upper eyelid may move for some time very much weakened. If the effect of either be neglected, or wrongly treated, or the subject be constitutionally, or the disease be aggravated by the effects of a strong exposure, bad food, severe mental trouble, and passion, or too long continuance of the disease, then, says Rees, there are apt to be produced, sometimes complicated with necrosis of the bone, the serious effects of which are some permanent and lasting weakness of the eye, and the appearance of a fistula. In a division of the eyelid, the eyelid may be a permanent fistula. 2. A strong inflammation of the eye when, with an insupportable itching. 3. A protrusion of the upper eyelid, from distension of the eye by the long continuance of the disease. 4. Inflammation of the sides of the eyelid, from a discharge of its vessels. 5. Extension of the eye, and the eye from loss of skin.

As in this species of inflammation the signs of sight must not be affected, unless the disorder extend itself very much, the exclusion of all light is more than of little use. Laxative purgatives will not be very good, or dangerous, and, as to the eye, and, with the exception of heat, there are to be used; but if the inflammation is attended with febrile symptoms, then they require the necessary antiphlogistic measures.—(Rees, &c. i. p. 275.)

In the second stage, with the exception of a few grains, Rees states, that the cure is to be treated the eye with warm fomentations. When the matter is situated in the middle of the upper eyelid, and for several

the skin, the stream may be allowed to burst of itself, especially if the patient have a great dread of the knife. But if the matter be near the outer or inner canthus, it should be let out with a lancet, as soon as its formation is quite distinct, the incision being made in the direction of the fibres of the orbicular muscle. When fissile or purulent have already taken place, the treatment should be such that which is applicable to the same kind of mischief in most other parts of the skin.

Exophtalmic inflammation of the eyelids usually affects both these parts together, very seldom only the upper one, and never the lower alone. When also both are affected, the disorder always presents itself in the greatest degree in the upper eyelid. A pale, yellowish, watery, transparent, shining swelling arises from the edges of the eyelids, and rapidly extends itself without any determinate boundary, the inner red colour being gradually lost upon the eyelids above, and not so perfectly upon the cheek below. When the inflamed part is gently touched, the vessels disappear, but only for a moment. At length the swelling towards the margin of the eyelids becomes exceedingly soft, and feels like a vesicle that has been raised by a blistering plaster. The pain is insupportable, and attended with itching, but rather with a sense of heat and stiffness; when the part is slightly touched, the patient experiences a lancinating sensation in it. Its temperature is not much increased. The secretions from the Meibomian glands, lachrymal gland, and mucous membrane of the conjunctiva are much increased. In a strong subject, the disorder, if protracted and neglected, is not productive of any constitutional disturbance; but in weak and weak females and children, it is sometimes attended with fever. However, when the symptoms partake of the phlogistic character, and is badly treated, the general symptoms are occasionally very severe at the change from the first to the second stage, and the case may then terminate in a gangrenous kind of suppuration. In infants, delicate children, says Rees, when the disease spreads over the face, the cure requires the most skilled treatment to prevent a dangerous termination.

In strong persons, the second stage of this disorder rarely ends in a violent suppuration, but is rather in an evolution of lymph, which, becoming dry, forms small, delicate, brown scales, in the composition of which the disorganized matter has also a considerable share. In other instances, vesicles of various sizes are formed on the eyelid, and surface, and burst, and discharge a fluid, which is converted into yellowish scales.

According to Rees, the skin of the eyelids is particularly prone to erysipelas inflammation. It is caused by the action of a cold blast of air, or of very cold water upon the skin of the eyelid, while in a state of free perspiration, as the most common cause of its being attended with erysipelas, particularly in weak subjects. The state, however, that the complaint may be terminated by the stage of heat, smart, and other lower accidents, which, when the scales are not retained, are liable to be followed by a violent and dangerous general inflammation of the eye, not infrequently extending to a painful degree to the eyeball itself.—(Rees, &c. i. p. 281.)

With regard to the prognosis, in other cases of erysipelas inflammation as frequently subsides without the aid of surgery as this, provided the constitution be healthy and strong; and when the complaint is confined to its first stage, the vestiges of it seldom are as little as those consequent to necrotic inflammation of the eyelid.

The second stage, however well defined, is followed for a long time by a peculiar sensibility of the skin to the impression of cold damp air, and a strong propensity to relapse. If, when the scales come off, a patient of weak constitution sit in a current of damp cold air, or try to wash away the scales and scales with cold water, then states that an erysipelas affection of the eyelid will be produced, which is often very obstinate, and apt to occasion a temporary inversion of the globe (Trichiasis), or a similar stage of the edge of the eyelid (Ectropion). And he observes, that even from ordinary but obstinate erysipelas inflammation of the eyelid sometimes in suppuration, the abscess is not then a common one, but the matter usually issues in a way, and through several openings in the variety

don of the parts. These pustules indicate the second or suppurative period of the second stage of the case, when either simple or epithelial, or the whole of the surface of the eye is completely becomes inflamed, and serious disease and permanent injury, the new formed places starting successively as the rest is absorbed, particularly in such a manner as to be a conversion of the tissue and pus and structure, thus the patient is afraid of opening his eye. When the patient expects himself, and sometimes in an unhealthy atmosphere, these eruptions of the eye becoming in the suppurative stage are always more extensive; that, they sometimes spread over the lower eyelid and down the cheek.

At length, after this throbbing has lasted, perhaps, several weeks, the suppurative process is checked and suppressed, either by surgical treatment, or accidental favourable circumstances, as change of residence, sea-bath, climate, &c., and then the eruptions immediately diminish. However, a morbid secretion from the Meibomian glands still continues, causing the third period of the second stage, and it is not to become habitual, if not resisted by art, or removed by the effect of accidental favourable circumstances, when it changes into a thin serous discharge, and the inflammation.

Thus, after the course of glaucous inflammation of the eyelids, or simple pustular ophthalmia, in the inflammatory operation of various agents acting chemically upon the edge of the eyelid, and upon the exposed follicles of the glands of the eyelid towards the inner canthus. He says, also, by whom many men are living together in a polluted, noxious air, have suffered with extraneous substances, that form of inflammation is said to occur even in the strongest constitutions with some frequency, that it seems as if it were epidemic. And, according to Beer, the principal cause of the disease will be found to be in the atmosphere, and the next most frequent sources of it, he observes, is acrid exhalations, as coming the eyes with hot water, &c. At the same time, he seems aware that this explanation would not of itself be always quite satisfactory; for he adds, that "although under the above circumstances no contagion, as yet, is supposed, there must be some particular condition which is conducive to the disorder, or at all events to its more rapid and severe course, and the quick extension of the inflammation to various individuals, which condition, he supposes, must depend either upon weakness of constitution, or upon excessive irritability, or, as he thinks it, susceptibility of the whole surface of the body. Beer makes no mention of the effect of damp nocturnal air in warm countries in giving origin to pustular ophthalmia, as much insisted upon by Baglivi and De Vries; but which doctrine, in reference to the origin of pustular ophthalmia in England, I think, completely false; and what is still more worthy of notice, Beer never attempts to resolve the propagation of the disease by its infectious nature. It is observed by De Vries, that the history of all diseases originating from some particular noxiousness received from the atmosphere, but which when spread of propagating themselves by contagion, is considered particularly difficult; because the same circumstances, which favour the communication by contagion, favours also a predisposition to be located upon the more prone causes existing in the atmosphere. The principal cause which gives form and appearance to the eruption of ophthalmia, in the existing individuals together have too limited space. The same circumstances De Vries has seen give a predisposition to diseases of an epidemic, but not a contagious nature; and hence he infers, that it may produce the same predisposition to diseases, which are both contagious and atmospheric.—"The appearance of pustules on the inner corner of the eye and on the cheeks was often met with long before the new destructive and violent disease (pustular) is described. In the story, such ophthalmia has been found to arise spontaneously, without any appearance of the disease except the redness of the conjunctiva; and, while the eye is inflamed, which salutes around the work, as to working in the dark hours, among the same, travail and sleeping more than less in a bed, readily access for the rapid extension of the disease in the same parts, yet the extensive spreading together of parts will effect of itself singular inflammation of the conjunctiva."—(On Diseases of the Eye, p. 71.) I believe, notwithstanding to the extent of all pustular ophthalmia, our present knowledge will permit us to venture an

assertion was the type of the preceding observations, which is, that they originate spontaneously, but probably usually both in this manner, and by the infectious nature of the disease being inadvertently applied in various ways to the eyelids of other persons. This species of inflammation of the eyelids is rarely met with by the surgeon in its first stage, because only very feeble patients then seek medical advice; and most individuals, who seek in other respects well, restore themselves by washing the eyes with cold water, and applying cold poultices, instead of local issues followed in water. Besides, when the disease is not very severe, it frequently subsides of itself; so in favourable constitution, better air is sometimes capable of restoring the healthy state of the eye. If, however, the disease at its commencement should be violent, or attack an individual of very weak habit, Beer states that it may immediately affect not only the Meibomian glands, but the pectiniferous of the cartilage of the eyelid, and produce an incurable ophthalmia, which is also said to take place when the case is neglected, and followed by deeply extending ulceration followed. When the ophthalmia is strictly epithelial, it never brings on any general indisposition, except, by improper treatment; it should happen to be converted into a violent inflammation of the whole eyelid, which, according to Beer, only happens in weak subjects, and women and children, whose state is in a very irritable state, or when a power of apparently good constitution resists under the influence of circumstances which tend to augment the inflammation, as, for instance, exposure to the air of a stable, privy, &c., in which event, Beer describes the inflammation of the eyelids as being quite of a pustular description.

As to the progress in the second stage, Beer observes, that if the eruptions at the suppurative period should spread all over the edge of the eyelids, and caused the patient to keep his eye frequently shut, a partial adhesion of the eyelids to each other (tenesmo-ophthalmia) may be the result. Also, when, at close of the periods of the secretion of tears, or at that of suppuration, the patient is content with merely anointing with warm water the thick matter gluing the eyelids together, so as just to be able to open his eye, and does not thoroughly dry the eyelids from the crass exudate of tears with proper remedies (see Treatment), whereby a secondary inflammation of the conjunctiva of the eyelid will be excited, which, Beer says, should be quickly dissipated from a more extensive of the glaucous inflammation of the eyelid. Such individuals, he observes, may easily become incurable, when the edge of the eyelid is seriously injured by the length of the excoriation. But if the suppurative process be resisted clearly to the pustules, especially the pustules (which case, according to Beer, is not infrequent in old, debilitated subjects of a relaxed constitution), and if the eruptions should deeply penetrate the conjunctiva of the eyelid, this may be completely destroyed, and the lower eyelid ruined.

As to the state of the atmosphere, acrid exhalations, crowded and close places, &c., are considered by Beer to be the principal causes of the glaucous inflammation of the eyelids, or simple pustular ophthalmia, one of the most important indications in the first stage of the disorder, so as to him to be the removal of those noxious influences. And he declares, that if immediate attention be not paid to such indication, it will be quite impossible to prevent a dangerous increase of the disease. A cool fresh air, and bathing the eye with cold water, or a weak lotion of vinegar and water, Beer represents to be means usually adequate to subside this inflammation to its birth. In the second stage, he says, the indication is entirely different.

But also in the beginning of this stage, and even at its second period, namely, that of suppuration taking place, the disorder, according to Beer, ceases for a short time to be benefited by the employment of cold water; but the consequences are avoided by such treatment a great deal worse; for a fresh quick, more extensive inflammation of the same kind again takes place. At the first period of the second stage, viz. while the secretion is a pure mucous and serous matter, Beer says, that it is absolutely necessary to employ such external means, as are calculated to promote the action of the veins and absorbents. For this purpose he recommends the following collimate: R. Ag. rom. Tlb. Hydrag. oxyanat. gr. j. vel gr. drachm. M. ad. em.

part of the cornea has been more or less perforated by the disease, the iris passes through all these openings to be in firm contact with the vitreous body, and the epithelium recedes. In a very short time, not exceeding a few hours, the inside of the iris is affected and turns like the drum, when it is detached, either with or without a portion of the vitreous humor. At length, the membrane detaches, and with it the protrusion of the iris, the opening in the cornea becoming closed with a firm or loose opaque flat cicatrix. But if in this destructive form of suppuration, nothing is done for the relief of the disease, the whole eyeball suppurates, the eyeball becomes covered instead of covered, and the focus between them closes for ever. In cases of badly constituted, when the cure is not properly treated, but persistently in weak children, and excessively violent form of suppurative inflammation, and suppurative epiphora with such rigidity, that a considerable general distention of the system is produced. Indeed, according to M. Trevisan, in the excessive course of the venereal form of conjunctivitis, suppurative epiphora, the system sympathizes; children are considered by a hot and dry skin; and the pulse is frequent and hard. Yet it is particularly pointed out by the same surgeon, that the possibility of the Egyptian patients to be in their generally attended with little constitutional disturbance. When the above described condition of the eye takes place, it is a warning to violent general inflammation in weakness, weak children, and even to some extent by a long while referred to an impaired state of health.

According to Beer, who appears to have no idea of venereal being venereal, the particular cause of this unfortunate extension of idiopathic glandular inflammation of the eye, both in infants and adults, frequently depends upon the fact that the eye is in a state of irritation and hence, says he, the disorder is in its first stage, is by a long and tedious process, where the eye is much contaminated by infection from the milk, the crowding together of many irregular persons, dry clothes, &c. The unclean state of exposing the eyes of infants to the rays of very dirty light, a woman knows, in which the child's head is covered a long while in the vagina, and usually washing the eyes after birth with a coarse sponge, and other circumstances supposed by Beer to be conducive to the origin of the complaint is now-born infants. The severity of many of these cases I regard myself with a good deal of doubt, and as far as the cooperation, that sparkling cold water in the head is required, which is a cause of periorbital, may produce the complaint, it is also plausible to find any venereal infection. The disorder, he says, is always more rapid and profound in new-born infants than adults (J. L. p. 266). It is evident which does not agree with the statements lately made, if the Egyptian ophthalmia, as well as the way, be considered. It is noticed by M. Trevisan, that the highly contagious nature of the suppurative ophthalmia, whether in the infantile venereal form, is sufficiently proved. For one person, affected with this disease, above three months old, he thinks at least twenty are attacked under his age. The manner in which it is first stage, of gonorrhea, and the disease is usually perceived about the third day. (Acquisit. Ac. p. 97.) Some further observations on the causes of some of these severe modifications of glandular inflammation of the eye will be introduced, after the general and common have been considered. This will be the more necessary, as the progress of the disorder by infection is here entirely overlooked.

According to Beer, whenever an idiopathic inflammation of the glands of the eye, arises the eye is first attacked in the suppurative ophthalmia of infants, the Egyptian ophthalmia, and gonorrheal ophthalmia, the progress must naturally be venereal, and this in a greater degree, the more the inflammation is and suppurative have extended to the eye itself. The same eye and even suppurative, when they happen in post, but, contrary, observed sometimes when it is venereal, also suppurative to extend from the inflammation which either arises, or has a previous effect upon, the disease. Should an accidental infection not be immediately noticed, says Beer, it will continue until the end of the second year, and even long after, as in the case of particular treatment. When the period of suppuration, which is the last of the conjunctiva

spread over the cornea is destroyed, the progress, in respect to the suppurative progress of the eye, is favorable, although it takes place but slowly. If the effects of the disease at this period should be deeper, yet the cornea not destroyed, only rendered flat and somewhat opaque; or if the cornea should be elevated at a very limited point, there will remain, in the last case, an opacity of the cornea; but in the second, a partial adhesion of the iris to the latter membrane (synechia anterior) is apt to follow, with a more or less extensive, situated on the cornea, covering it a greater or less degree the humors and displaced pupil, and thus discharging as preventing vision. When, during the inflammation and suppuration, a considerable part or the whole of the iris adheres to the cornea, and this is not prevented by absorption, the result, in the first case, is a perforia, in the second, a complete proptosis of the cornea, which does not fully develop itself until towards the decline of the second stage of the inflammation. If the inflammation should spread to the tissues of the eyeball itself, so as to produce severe constitutional disturbance, the eye would away in the midst of the process discharge, the system sink inwardly, and the distance between them becomes permanently closed. (Beer, J. L. p. 219.)

Beer, makes the opinion of the celebrated Stenstrom, which was, that the ophthalmia, in particular, suppurative, involving the sclerotic membrane, always has a first duration of a month, in new-born infants, and of six, eight, or twelve weeks in adult individuals. Beer acknowledges the correctness of this opinion, only in cases where the suppurative has to deal with a suppurative (suppurative) inflammation, and not in a more recent case, or one in which the disease is chiefly confined to the tissues of the eye. (Idem—Stenstrom.) When the disorder is not with in the first period of the second stage, or it is confined to the suppurative suppurative and venereal glands, and truly suppurative, Beer asserts that it cannot stay, be restricted by efficient treatment to a few days, as he has often proved in the establishment of the hospital in Vienna.

It is further remarked by Beer, that in this modification of venereal suppurative inflammation of the eye, the indications have according to him, in these. If, by chance, the eye is not with the disease in its first stage, it will be more benefited by the application of cold water, wet with cold water, and sometimes a brisk purge of jalap and calomel, and putting a leech over the internal side of the lower eyelid, will promote the subsidence of this dangerous species of ophthalmia. The cure, however, easily prevents itself for medical treatment than early, and in hospital, Beer says, antiphlogistic treatment is, on this account, hardly ever indicated.

With some exceptions of importance, the treatment advised by Beer, for the second stage of these severe forms of gonorrheal ophthalmia, involves that proposed by him for the second stage of simple idiopathic inflammation of the eye, in the earlier stages. These more severe kinds of venereal inflammation of the eye, implied by Stenstrom's treatment and ophthalmia-venerea, he says, should never be allowed and treated merely as local diseases; but that, both in children and adults, internal remedies should be exhibited, particularly saline medicaments. In cases where the cornea is already attacked by a destructive ulcerative process, mercurial exposure has proved him thus best, combined with mercury, and the discharge of pus, is the only means of saving the eye; but that, if the suppuration be confined to the eye, the direction of external treatment with mercury and opium will usually prove. When, as the experience of suppurative, the pain is the eye and neighboring parts is extremely severe, Beer asserts, that friction with a liniment of opium will give great relief. In new-born infants, the external use of mercury will mostly do more good than internal medicine; but if the case be urgent, and the child feeble, Beer thinks venereal medicines may sometimes be useful.

With regard to particularities, while recovery is the local treatment by the method above of the inflammation, Beer offers the following information: first, in new-born infants, or very young children, the experience of mercury cannot be used without danger, should be used with caution; and even in adults it should be employed in these cases with great care.

specimen. Secondly, the water and purulent matter should not be allowed to remain long under the eyelids, as such impurities tend to promote the destruction of the layers of the conjunctiva situated on the cornea; but at the same time, those fluids, that having any weight on the eye, after cleansing them, and letting it become cold there, will have quite no pernicious effects. Hence, in a very particular manner, all the mucus and purulent matter to be swept away from the eye with a bit of fine sponge, moistened with a warm watery saline solution, but not so wet as to let the fluid drop out of it; or when they are very copious and in large flakes, be even recomended to be washed away by means of Angel's syringe; but he says that every part about the eye should be immediately afterwards well dried with a warm napkin, and then covered with a warm camphorated ointment. Thirdly, during the supplicative period, according to Beer, constant friction of opiate, or the viscus tincture, is the best local application, the part being washed with it twice a day, by means of a fine clove-brush. It is only in a few instances, that a small proportion of the aqueous distillate (see *Ischaemic Oedema*), mixed with the watery saline solution, can be used. Beer declares that the best ever seen any good produced by them; that the best is that which was slightly prepared by means Mr. Ware. Fourthly, when the supplicative period has terminated, the mucous secretion again becomes white and thin, as at the very commencement of the second stage, but it is always more copious; now, is the time, as in the last stage of simple phlegm, inflammation of the eyelids when the topical use of mercury, joined with styptic, especially in the form of an eye-salve, is indicated. Fifthly, if an eversion of the upper eyelid should happen from washing the eye constantly, or the mere crying of the infant, by consequence of the thickened granulated state of the palpebral conjunctiva, the position of the eyelid must, if possible, be immediately rectified; for otherwise this defect is done. In order to avoid this eversion, the eyelids should never be opened while the child is crying, or in any way agitated. For at such periods, the thickened sclerotic conjunctiva will suddenly protrude, and cannot be kept back. Beer says, that the eyelid should be replaced in the manner directed by Schmidt.—(*Ophthalm. Hist.* 3, 4, 2, book p. 493.) The surgeon, having removed the coat of the tarsus and fore-layers of each of his lids with flesh force, is to take hold of the everted cuticle of the eyelid in the outer and inner canthus, draw it slowly a little upwards, and then suddenly downwards. The thickened conjunctiva, if not too fleshy and granulated, may be quickly reduced, and the corneal surface exposed. But if the swelling of this membrane should be already very considerable, and have begun to be hard and studded with excrescences, the thumbs should be placed so as to compress the middle of the eyelid. However, if the corneal surface be so much affected, it is to be treated, after the termination of the second stage of the puerile ophthalmia, in a series of this manner.

—See *Ectropion*.

In the ophthalmia-blennorrhoea, the alteration of the sclerotic conjunctiva is said by Beer to be very different from chemosis; a chemosis which is merely correct, inasmuch as cellular chemosis is not attended with thick change in the surface of the sclerotic conjunctiva, which first is the secretion of pus. But if we are to understand by chemosis a copious effusion of lymph in the loose cellular substance between the conjunctiva and the eyelid, this state must be observed in one of the usual effects of severe puerile ophthalmia.

"It is under this usual condition, which is characterized by the suppurative ophthalmia says Mr. Travers, that the conjunctiva first assumes excrescences, granulations, then, in hard cases only, protruding between the palpebra and globe, and covering the latter, as, if not destroyed, causing the turning of the lid over the eye globe. The third period takes us from the same state the hard granulated surface, which keeps up increased irritation of the sclerotic conjunctiva, and at length reaches the corneal epithelium."—(*Travers*, 47, p. 385.)

The treatment recommended by Mr. Travers for the venous and arterio-venous inflammation of the conjunctiva, consists in a very copious hemorrhage, by which, he says, the pain is mitigated, if not removed, the pain abated; and the patient sinks into a sound

sleep, and purifies freely. The high morbid heat and bulk of the chemicals are thereby reduced, and the system is lightened. The blood being, if necessary, it is to be repeated, and the patient kindly purged, every day of the opening venous being followed by a transfusion of a mixture of arsenic, tartar, or so to keep up a state of tension, perspiration, and resolution. When the discharge becomes thick, grey, and from chemosis, the swelling of the eyelid subsides, the conjunctiva sinks and becomes pale and fleshy, the pain and local irritation are past, and the cornea returns to its usual brightness. Mr. Travers remarks the same day, and states that the prompt subsidence of mucus, with the use of feeding and digesting lotions, will prevent its passing into a chronic form. "But if, when the bleeding practice has been pushed to the point of effusion, some inflammation, the patient being at the same time weak and exhausted, the cornea shows a dark stain and appearance of its whole surface, as if it were by immersion in an acid, or a gray stain in the centre, or a line extending or half-extending in line, assuming a macular appearance, the patient is washed out with facility by detached by a rapid double vision it is a decided sign of the puerile blennorrhoea, being an indication of catarrh, so as to produce in it that which may render it permanent."—(*Travers*, 47, p. 385.) Here we find some approximation of opinion between Mr. Travers and Professor Ross, for the almost the only point at which any resemblance can be found in their modes of treatment.

The granulated or fungous state of the palpebral conjunctiva, produced by puerile ophthalmia, sometimes demands particular treatment when the original disease is subdued. If such state of the eye be not subdued, it often keeps up a "glazy discharge," unsuitable to light, dropping of the upper lid, a pricking sensation as if sand in the eye, and a permanently troublesome and vascular state of the sclerotic conjunctiva. With these are frequently combined symptoms of the cornea.—(*Travers*, op. cit. p. 221.) The effusion, as compared with opaque cornea, is particularly noted by Dr. Vetch, who describes the disease of the pupil as consisting, in first, in a highly vascular state of the vascular tissue, which, if not treated by appropriate remedies, gives birth to granulations, which in process of time become more deeply extended, hard, or warty. Along with the effusion and thickening, and of the lining of the eyelid, there is a gradual ejection of purulent matter, which may at any time be squeezed out by pressing the finger on the eye. The deepest structure is highly vascular, and strongly protrudes when cut. It processes, and granulated substances do a very great extent of growth, or multiplication. Dr. Vetch has seen many cases in which it has been removed with ease and this function, many or thirty times successively, without the disposition to reproduction having suffered any diminution. Indeed, he assumes as that the operation will very effectually be the ultimate recovery of the pupil. "A new surface is produced of a highly vascular appearance, much less susceptible of cure than the original disease, and often, even if it is locally treated, does not assume the natural appearance of the part, but that of a elevated surface," not attended with a return of the transparency of the cornea. It is notwithstanding proved by the observations of Dr. Vetch, that granulated growth of the inner surface of the eyelid was not only seen in children and other and paratubercles, under the name of leucophaea, leucos conjunctivae, &c., but may be known by the actual history, extension, and growth, and also recommended by them. The benefit of this operation is the probable state of eye with respect to it. Dr. Vetch states in 47, that no treatment appears to Dr. Vetch more efficacious for this disease than the exposure of copper and nitrate of silver. "It says that they should be pointed in the form of a point, and fixed in a perforation." "They are well applied, not as others have conceived, with the view of producing a scab over the whole surface, but with great delicacy, and in so many points as to well produce a gradual change in the condition and disposition of the part." As long as any granulated growth of Vetch states that the above operation will be well suited by the daily use of the leucophaea solution. When the disease returns some resolution, and the eye is to be hard and watery, he applies very minute quantities of finely-digested powder of vitriol, or lead

alone, to the inverted surface with a few dried hair pencil, but usually rather than off with a syringe before the eyelid is required. The caustic pencil, lightly applied to the more prominent parts of the diseased surface, will also answer.—(See *Poissin on Diseases of the Eye*, p. 73, &c.) Mr. Lloyd also gives his testimony in favour of the superiority of the nitrate of silver, which he has employed in the form of a saturated solution for restoring the healthy state of the inner surface of the eyelid.—(On *Scrofula*, p. 328.) The practice of excision was followed by the ancients, and revived of late years in England by Mr. Keen, who, with almost what Sir W. Adams and others have subsequently performed with a knife or bistoury. Mr. Travers, I may observe, is also one of the advocates for the excision of the granulations and hardened integuments of the conjunctiva. If there be a rotundity of the cornea, with a placid of vessels extending to it, there are then divided near the edge of the cornea, in the manner recommended by Scarpa. Mr. Travers afterwards applied a solution of the sulphate of copper, the tincture of iodine, or the strong tincture of opium. The remark which he makes tends very much to confirm the general advantage of the practice introduced by Dr. Vetch; for, it is observed, "the application of the blue-stone, or of the lunar caustic, is often useful in preventing the regeneration of the granulations after their excision."—(*Synopsis*, &c. p. 221.) My friend Mr. Lawrence, whose experience in diseases of the eye is a very considerable, informs me that he finds caustic the more modest of practitioners reserving the granulated fungous state of the inner surface of the eyelid, and that, when the granulations are not away, they are frequently reproduced; a fact to which Dr. Vetch has justly justly assigned.

Egyptian Ophthalmia. One of the best accounts of this disease, as it appeared in the army, is that delivered by Dr. Vetch. Although there can be no doubt that the disorder, in all its general characters, closely corresponds to the whole class of acute conjunctival inflammations of the conjunctiva, as described by Boerhaave, yet it has some peculiarities. Thus, one thing noticed in the Egyptian ophthalmia, but not in other purulent ophthalmias, is, that the first appearance of inflammation was always in the lining of the lower eyelid.—(*Poissin on Diseases of the Eye*, p. 100.) According to the latter writer, the degree of cut of nasal rolling in the eye, is a symptom requiring particular attention, as its occurrence in a certain index of the disease being on the increase. It is subject to exacerbations and remissions, the attacks always taking place in the evening, or very early in the morning. The first stage of the disease is said by Dr. Vetch to be characterized by its progress uniform redness, without that pain, burning, or intolerance of light, which is common to most other forms of ocular inflammation; and, in particular, that in which the sebaceous root is affected. From the very beginning of the complaint, there is a disposition in profusion in the cellular texture between the conjunctiva and the globe of the eye, often suddenly swelling up into a state of complete thrombosis, and at other times making a more gradual approach to the cornea. While effusion is then taking place upon the eye, motion is likewise going on beneath the integuments of the eyelids. The excessive transudation of the eyelids is said to be generally commensurate with the complete formation of chemosis; ectropion is produced, and the integuments of the two eyelids meet, leaving a deep cleft between them. When the external swelling begins, the discharge, which was previously moderate, and consisted of pus floating in a watery fluid, changes into a copious stream of yellow matter, which, mixed with the hardest secretion, greatly increases in quantity that derived from any position. Although, says Dr. Vetch, the inflammation may be at first limited to one eye, it soon invades the other, it generally reaches its greatest height in both about the same. The patient never began to suffer from attacks of characteristic pain in the eye, a certain indication of the extension of the attack. "An occasional remission, as if motion were threatening the eye, accompanied with sleep and freedom of the eyelids, often precedes the deeper-seated pain." This is often of an alarming nature, and a period of supplicating torture is succeeded by an interval of pro-

fect ease. Sometimes, the pain shifts intermittently from one eye to the other, and is seldom or never equally severe in both at the same time; and sometimes, instead of being in the eye, it occurs in a circumscript spot of the facial, which the patient describes by saying he can cover the point with his finger. Sometime or later, one of these attacks of pain is terminated by a cessation of rupture of the cornea, with a rush of scalding water, succeeded by immediate relief to the eye, in which this wound has happened, but generally soon followed by an increased violence of the symptoms in the other. At length, the attacks of pain become shorter and less severe, though they do not cease altogether till after the lapse of many weeks and even months. During this stage of the disease, according to Dr. Vetch, there is seldom the slightest alteration of the pulse, unless the lowest have been formerly employed. The patient's general health is little impaired, his appetite remains rational, but sleep almost totally forsakes him.

As the pain abates, the external transudation also subsides; and a gaping appearance of the eyelids succeeds; their edges, instead of being inverted, now becoming everted. This is what Dr. Vetch designates as the third stage of the disease.

After the swelling of the second stage has subsided, the eyelids are prevented from returning to their natural state by the continued change of the conjunctiva which takes place; and an extension of their normal position is a greater or less degree.—(*Poissin on Diseases of the Eye*, p. 200, 201.) Among most interesting remarks made by the same author, in stating, that there is no reason to warrant the idea that the inflammation proceeds from within outwards. He observes, that when any large portion of the cornea sloughs, an adhesion and vascular membrane is often produced, which finally forms a staphyloma. In some few cases, says he, I have seen the lens and its capsule exposed without any external covering whatever; and, for a short time, the patient can see every thing with wonderful clarity; but, as soon as the capsule gives way, the lens and more or less of the vitreous humour escape, the eye shrinks, and the cornea constantly takes a small horn colored spot." This total destruction of the globe of the eye is said generally to smother the other, and renders a less liable to be affected by future attacks of inflammation.

A few years ago an ophthalmia, supposed to be of the same nature as the Egyptian, though milder, like that which has generally been observed in schools, occurred to a great extent in the Royal Military Asylum at Chelsea, and Sir Patrick Macgregor, the surgeon, observed the public with an excellent disposition of the disease, and some highly interesting facts and reflections upon the subject. The symptoms generally made their appearance in the following order: "A considerable degree of itching was first felt in the evening; this was succeeded by a sticking together of the eyelids, principally completed of by the patient on waking in the morning. The eyelids appeared thicker externally than they naturally are; and on examining their internal surface this was found inflamed. The subconjunctival glands of the nasal were considerably enlarged, and of a redder colour than usual. The external lachrymalis had a similar appearance."

In 1810 to 25 hours after the appearance of the above mentioned symptoms, a violent mucous discharge took place from the internal surface of each eyelid, and lodged at the lower margin, till quantity was sufficient to be pressed over the cheek by the motion of the eye. The vessels of the lachrymal conjunctiva covering the eyelid were discoloured with red blood, and the lachrymal conjunctiva was generally in thickened and raised as to form an elevated border round the transparent cornea. This state was often accompanied with motion of the globe against the eye, which sometimes extended to a considerable distance, and resembled in colour and in a very much what takes place in the cow pox pustule, between the ninth and twelfth days after inoculation.

When the purulent discharge was considerable, there was a swelling of the external eyelids, which often prevented the patient from opening them for several days. The discharge also incessantly accompanied the cheeks as it trickled down. Exposure to light caused pain. When light was excluded, and the eye kept in darkness, pain was seldom much complained of.

* These symptoms in many subside without much aid from medicine, in 12, 13, or 14 days, leaving the eye for a considerable time in an irritable state. In several, however, the disease continued for a week longer, and sometimes took place on the internal surface of the eyelids, and in different parts of the eyeball. "If one of these eyes is supposed to be attacked in the transverse channel, it generally, on looking, left a white spot, which, however, in the young subjects under our care, was commonly even observed. In some few instances an elevated cock-plum on the substance of the eyeball, which, baring externally, produced irreparable blindness."—(See Treatise for the Improvement of Mind, and Char. Knowledge, vol. 2, p. 31—40.)

When the third symptom had prevailed beyond three days, some fatal disturbance occurred. And, except in seven cases, it was nearly always fatal.

Dr P. McGee considered this ophthalmia to be of the same nature as that which raged with such violence in the army at different periods, after the return of hot troops from Egypt in 1802, 1803, and 1804. However, he found that its consequences were not so injurious to children as to adults; for, out of the great number of children afflicted with this disease at the Hospital, only six lost the sight of both eyes, and twelve the sight of one eye.—(Op. cit. p. 43.) On the other hand, Dr. Vesalius informs us, that in the recent epidemics in the Mediterranean, which consisted of somewhat more than 200 men, 626 cases of ophthalmia were observed; and the highest numbers, August, 1805, and August, 1806; and that "of this number, fifty were diseased with the loss of both eyes, and fifty with that of one." And as Dr P. McGee observes, it is a particularly fatal, in appearance from the return of Eastern and Mohammedan troops, that 2117 soldiers were, on the 1st of December, 1811, a victim to the epidemic, and blindness in consequence of ophthalmia. The cases in which only one eye was lost are not here included.

The attack of the disease appears to be least more frequent, severe, and obstinate, in hot, sunny weather, than in cold or temperate seasons.—(Op. cit. p. 27, 34, 40.)

Dr P. McGee also observed, that the ophthalmia sometimes began and continued in persons of hot temper, or a sanguine habit, than in others. The right eye was more frequently and severely affected than the left. In several, the symptoms were greatly aggravated for some days previous to the commencement of the examination taking place, they were quickly relieved. Dr P. McGee further remarked, that the disease, not only, and perhaps even through their means, is frequently in persons affected with this species of ophthalmia, so when no other disease was present; a circumstance which, with some others, prove that the disorder was entirely local.—(P. 34, 35.)

With respect to the causes of the Egyptian Purulent Ophthalmia, much difference of opinion has prevailed, and indeed there was a time when the disease was regarded by the majority of many writers, who also distinguished the epidemic from local epidemic causes; the irritation of sand; the activity of climate, &c. The late Mr. Ware even doubted the propriety of calling this ophthalmia Egyptian, and he concluded that the disease, previously similar to its symptoms and progress, had been noticed long ago in Asia and other parts, and that, in Egypt, several varieties of ophthalmia prevailed. He suggested calling the disease the Egyptian Purulent Ophthalmia. On the other hand, Dr W. Adams conjectured, that it ought rather to be called Asiatic Ophthalmia, as several investigations prove that it prevails in the greater part of Asia, and was long ago described by Aesculapius.—(Graefe, *Journal*, vol. 1, p. 179.)

That this disease has long been in this country as infectious species of purulent ophthalmia, cannot be doubted. The one described by many surgeons, as proceeding from the sudden escape of gonorrhoea, or the undiminished application of gonorrhoeal matter to the eye, which always will be properly noticed, is certainly an infectious purulent ophthalmia. It is also found in infectious purulent ophthalmia, by the admission, that infectious purulent ophthalmia, by the intensity and rapidity of its progress, but the latter is strongly characterized by the epidemics with which it is associated, especially in adults, opacities, or al-

terations of the cornea; the long continued irritability of the eyes after the subsidence of inflammation, but more particularly the very infectious nature, by which it spreads to any extent that may arise from infection with regard to any other species of purulent ophthalmia. There have been epidemic ophthalmias of other kinds which have been known to affect the greater part of the population of certain districts and even in Asia. The celebrated ophthalmia which raged in Newbury, in Berke, some years ago, is an instance that must be known to every body. But I know of no infectious inflammation of the eye, which ever spread to a great extent in England, before the return of the troops from Egypt.

The infectious and observations of Sir F. M. Owen, as well as those of Dr. Vesalius and Dr. Edmonstone, I think, leave no doubt of two facts: first, that the ophthalmia was of all kinds brought from Egypt, and, secondly, that it is infectious. And only on the basis of being communicated from one person to another by actual contact of the discharge. "If says Dr. Vesalius, my belief, more sustained by the effects of the Egyptian army, during the first expedition to Egypt, that the disease was contagious, it was of a nature very rapid and obstinate. Combined as its operation is extremely violent, and as that country much more healthy than ours, there would be more difficulty in the first introduction of the fact. But the continuance of the complaint with the troops after their departure from the country, could scarcely fail to lead to the obvious conclusion of its possessing a power of propagation. Hence the disease reached this country, the opinion of its being contagious was adopted by many. Dr. Edmonstone, in the account which he published of the disease as it appeared in the regiment to which he was surgeon after its return to England, first made the public acquainted with the fact of the disease being contagious. It is an account of the Egyptian ophthalmia, as it appeared in this country, printed in the early part of 1805. I first established, that the communicability of the disease was exclusively produced by the application of the discharge from the eyes of the diseased to that of the healthy."—(On Diseases of the Eye, p. 179.)

The opinion, that the disease is not communicated from one person to another, through the medium of the atmosphere, is at present nearly abandoned. Being the whole time that Dr. Vesalius had the management of the ophthalmic hospitals, there never was an instance of any medical officer contracting the disease, although exposed to what might be supposed to be the greatest concentration of the contagion that could arise in the most stage of the complaint. Two ophthalmias only contracted the disease, and both in consequence of the actual application of the virus. However, Dr W. Adams maintains, that he has seen many cases, which prove that the disorder, like small-pox, may spread naturally without any kind of inoculation.—(See Graefe's *Journal*, vol. 1, p. 174.) That the disease may be partly propagated by epidemic causes in particular situations, I think is certain and clear, so that there may be a true for the first communication of the disorder in situations where infection by contact is not of the parties. And as Dr. Vesalius has observed, "from whatever cause the inflammation of the conjunctiva and cornea, when the active is of that nature, or degree of violence as to produce a purulent or purulent discharge, the discharge, as good and operates as an infectious virus, when applied to the conjunctiva of a healthy eye. Considering the various modes by which such a contact may inevitably occur in the usual relations of life, it must be evident, that wherever ophthalmia prevails, whether it be the effect of local conditions of the soil or of the atmosphere, naturally or artificially produced, this contagious element sooner or later, but as it is in contact with that of the more general and original cause, and hence, without regard to this point of the disease, its transmission must often operate imperceptibly, and at variance with the more general cause, either in external circumstances. And, further, as the disease is moderated by temperance is of a nature more violent and malignant than that produced by the exposure of a conjunctiva to the air, it will, in every instance of excessive purulent ophthalmia, operate most different forms of disease, which, as long as they are continued as long and the more, will produce, according as the one or the other predominates, very different results."—(On Diseases of the Eye, p. 179.)

Dr F. McGregor relates three cases, which prove that the matter, after its application, produces its effects in a very short time. I shall only cite the following example.—On the 2nd of October, 1855, about five o'clock, p.m., Naomi Parnoody, while spraying the eye of a boy, let some of the lotion which had already washed the diseased eye pass out of the syringe into her own right eye. She felt little or no stinging at the time; but towards nine o'clock the same evening, her right eye became red and somewhat painful, and when she awoke next morning, her eyelids were swollen, there was a painful discharge, pain, &c.—(Op. cit. p. 51.)

The late Mr. Ware, though he admitted that the infection was brought into this country from Egypt by the troops, conceived that the same disease also sometimes arose from the matter of gonorrhoea being applied to the eyes, and that it had been prevalent in this country before the arrival of the army from Egypt. He thought, however, that the infection was generally communicated by contact. Mr. Ware observes, some of the worst cases of the purulent ophthalmia of children have happened in those whose mothers were subject to an acrimonious discharge from the breasts at the time of parturition. Some of the worst forms of the purulent ophthalmia in adults have occurred in those who, either shortly before the attack of the ophthalmia or at that very time, laboured either under a gonorrhoea or a gleet. Mr. Ware does not mean to suppose every purulent ophthalmia to be such a case; but in the majority of adults whom he has seen afflicted, if the disorder had not been produced by the application of morbid matter from a diseased eye, it could be traced to a connection between the ophthalmia and disease of the urethra. Other causes, Mr. Ware acknowledges, may contribute to aggravate, and, perhaps, produce the disorder, and the purulent ophthalmia in Egypt has been imputed to a great number. The continued influence of heat and light, of a burning day, continually rising by the wind, and of the heavy dew of the night, may powerfully tend to excite inflammation of the eyes. Yet something more necessary to account the malignant ophthalmia now under consideration, for the same causes operate with equal violence in some other countries besides Egypt, and yet do not produce the same effect; and in this country (says Mr. Ware), the disorder prevailed during the last summer to no great degree, and upon as great a number of persons, within a small district of less than a mile, as it ever did in Egypt; and yet, beyond this space on either side, scarcely a person was affected with it. The disorder was certainly brought into this country by the soldiers who returned from Egypt, and was probably communicated from them to every soldier. Now, as the action of the atmosphere alone cannot account for the spreading of the disease, &c., Mr. Ware is led to believe, that this particular disorder is only communicable by disease vessels; that is, by the application of some part of the discharge which issues either from the conjunctiva of an affected eye, or from some other morbid secretion in similar position, to the conjunctiva of the eye of another person. In schools and hospitals, in consequence of children using the same basin and towels as others who had the complaint, the disease has been communicated to nearly twenty in one instance. Hence, Mr. Ware considers the instructions to use of these articles in schools, hospitals, barracks, ships, and barracks.—(P. H. G.)

That in Egypt the origin of the disease cannot properly be traced to the effect of the sand and hot winds of the country is clearly proved; but, because, if this were the case, the disease would not be more prevalent in the external season during the introduction of the Nile. Mr. Ware infers that the disease would not be more subject to it than the Bedouin Arabs, who live on the banks of the desert. Not only the Bedouin Arabs, says Dr. Vetch, remain free from the disease, but Europeans also are not particularly exposed to it, though they are also liable to its attacks. The nature of military duty prevented our soldiers from using this precaution, and in a particular manner they became victims to the complaint. The men suffered more in proportion to the influence of the English army; as the heterogeneous, better thought men in insubordinate defiance than the soldiers and domestics of the native, and officers employed in military duty suffered more than those attached to the civil de-

partments.—(Vetch on Diseases of the Eye, p. 137.) And Asselin remarks, that if the dust or sand were the sole cause of ophthalmia, we ought to be exempted from the disease where the cause does not exist. The contrary, however, was the case in the Delta, and particularly in the cultivated lands of the Nile during its inundations. When we were exposed to the air during the night, we were immediately attacked with ophthalmia, though the dust and sand were then under water. Lavery was exposed to the origin of the disease in the cold, damp nocturnal air after the great heats of the day.—(Graf's Journ. i. 1, p. 133.)

Whoever reads the account of the Egyptian ophthalmia, as given by Dr F. McGregor and Dr. Vetch, will be convinced, that the disease is only communicable from one person to another by the application of the infectious matter to the eyes. Probably the common mode of propagation is the introduction of the same matter, or even merely touching the same articles which have been in the hands of infected persons, who must be supposed occasionally to apply these fingers more or less to the eyelids. In this way, the communication of the disease may be accounted for in instances upon their entering into barracks which have been visited by other infected soldiers. "Fever, in warm weather (says Sir P. McGregor), are seen in great numbers surrounding patients labouring under ophthalmia; and I much suspect the very frequently the medium by which the disease is propagated."—(P. 24.) The matter is observed to become infectious when the disease is in an acute state.

Dr. Vetch adverts to two important questions connected with the history of the Egyptian ophthalmia. The first relates to the length of time which the disease has, at different periods, lain dormant, and especially between the return of the troops from Egypt and the breaking out of the disease in the 20th regiment. An explanation of this fact is attempted by supposing that the complaint exists, and is liable to a renewal of its infectious quality, long after the eye seems to have recovered its natural and healthy appearance. Perhaps it would be as well to be content with the fact, that in crowded barracks, under particular circumstances, soldiers who have once had the disease are very liable to relapse. The other question is, why has the disease produced such ravages in the army in England, and not in that of France? It is well known that the French soldiers in Egypt suffered as much as our own troops from the affection, and great numbers of them returned to France with the disease in a chronic form. "In fact (says M. Roux), the influence of their native climate has sufficed for the removal of all vestige of the disorder. On the contrary, in soldiers it has continued in a chronic state, either attended with the loss of one or of both eyes; and many of our invalids remain with the affliction. But it has not been found, that those soldiers who returned from Egypt have ever communicated a contagious ophthalmia, either in regiments as well as many of them have been incorporated, or in invalid battalions, where others have obtained their retirement; or in the individuals belonging to the different classes of society. Such is the objection that has been made, and may always be again urged, against the opinions and conclusions of the English, respecting the Egyptian ophthalmia."—(Ferguson's & Lombard on 1814, on Paralysis de la Vue, &c. p. 45.)

Lavery, who admits that the disease may be communicated by application of the matter, argues that it is not contagious in any other way, because, in Egypt, for want of sufficient hospital room, patients with this and other diseases, were crowded together without the ophthalmia being propagated to any of the patients, who were careful to avoid the above mode of infection.—(Graf's Journ. i. 1, p. 133.) Lavery, however, need not have used this reasoning with us, because it is unnecessary to him to suppose, that the disease is here continually revived in communicable through the medium of the atmosphere. While, however, English surgeons chiefly explain the extension of the disease by the infectious matter of the discharge when applied to the eyelids, and Lavery admits that the matter is thus infectious, the latter, as well as Roux, assumes that none of the healthy soldiers who came home with the blind invalids from Egypt were attacked with this species of ophthalmia. A great number of these invalids were received in the hospital of the gendarms at

them, and treated them without any of the other poisons being infused.—(*Gazette's Journ.* Jan. 20.) On my return from the Mediterranean through France, in 1802, I saw many of the French troops at Aix and Avignon with bad eyes, contracted at Egypt, notwithstanding with other soldiers, whose eyes were perfectly healthy, and living in the same barracks; a proof that the French soldiers, with the exception of camels, or some other poisoning cause, were placed apparently in circumstances in which the disease here made such extensive ravages. This is a point which I hardly conceive is not at all alluded to by Dr. Vesali's belief, that the difference is principally by the French troops being sent into the field; for, in fact, the soldiers with diseased eyes were in barracks or hospitals as well as our own troops.

But notwithstanding it seems proved, that the discharge from the eyes in the Egyptian ophthalmia is so actively infectious in England, it appears from an experiment, made by Mr. Mackenzie, that the application may sometimes be made to a healthy eye without the disease following as a matter of contagion; for he applied to his two eyes liquor impregnated with matter discharged from the eyes of patients in the fully formed stage of the disease, and even altered some of the matter in pus under the eyelids, yet the complaint was not communicated.—(*See Edinb. Med. and Surg. Journ.* vol. XL, p. 441.)

One of the most natural circumstances in which the practice of English surgeons differs from that of foreign practitioners in cases of severe purulent and especially Egyptian ophthalmia, is the frequency and boldness with which the former attack the disease in its first stage. Mr. Ferri recommends taking away at once as much as 60 minims of blood (*Edinb. Med. and Surg. Journ.* for January, 1807); and Dr. Vesali lays great stress on the striking benefit of bleeding the patient till syncope is produced. "When inflammation in the seat in the subacute point (says he), general blood letting may for the first part be dispensed with, and even when employed to the greatest extent, the same benefit does not ensue. In the purulent inflammation of the conjunctiva, however, although some good may be derived from depletion, yet a perfect cure over the disease depends less on lowering the system than on the judicious control of acridal action by eversion, which it becomes the object of the operation to produce. This position, besides its efficacy, will accompany the cure with a much less expenditure of blood than is occasioned by the repeated bleeding constantly and because to whom this method of rendering one equal to the cure of the complaint has been rejected. Some time before the approach of darkness the surface of the conjunctiva for the most part disappears; but this is no security against the return of the disease, if the flow of blood be stopped, without delicate and steady attending."—(*On Diseases of the Eye*, p. 398.) The attacks of a painful granulation, as if poured more in the eye, in some cases as a proof of the disease increasing, and, in the early stage of the disease, as a better indication of the necessity of bleeding, than the appearance of the eye itself.

With respect to applications, Dr. Vesali speaks very highly of the beneficial effects produced in the beginning of the case by dropping into the eye the undiluted liquor plumbi subacutale, which, he says, dissolves the discharge, lessens the inflammation, and is incapable of doing harm in any stage of the disease. He places great confidence in the salutary results of a free exposure of the eye to the atmosphere, and speaks in high terms of the good derived from applying at night to the eye an infusion of tobacco; thus declaring the leaves to emit vapors of water. "It possesses large Dr. Vesali the valuable properties of acting as a powerful anæsthetic, removing the purulent discharge, and dissolving the albumen or external swelling of the palpebra; at the same time that its narcotic qualities often remove the pain and the purulent granulations which the largest doses of opium cannot relieve."—(*P. 411*.) Bleeding, however, is the "chief remedy," and the only means of preventing the dissemination of the system, whenever attacks of pain in the eye or with some of the unsatisfactory state of the disease.—(*P. 402*.) When the disease shifts to various eyes one eye to the other, and long lasting discharges, Dr. Vesali recommends tapping, and the eye to be again carefully treated by the injection of tepid water or any gentle

stringent lotion; and afterward wiped dry. When the discharge continues and swelling in these stages is to be applied to the shape of the work and behind the ears. He wishes it to be distinctly kept in mind, that the time for the employment of bleeding, with the view of saving the eye, is during the first stage, or early part of the second; and when abatement of the common line commenced, the time is to be treated on the principles applicable to chronic inflammation.

With regard to the plan of discharging inflammatory action by medicines which excite nausea and sickness, instead of having recourse to the vomit, Dr. Vesali states, that he seldom if does not answer well, and to the end purges more debilitating.

As soon as the external motion of the eyelids subsides, and they begin to be exerted, Dr. Vesali resumes the granulations and general eversion, by a very light and careful application of the argentine solution. The eversion portion is then to be continued, and as long as it is useful with a compress and bandage. The method is to be repeated every time the eye is closed, and in the course of a fortnight the tendency to suppuration will be removed.—(*P. 399*.)

As a last resort, vesication, or caustic application, and even more harmful. He first dipped his fingers, and then introduced into their tips a few drops of a solution of the lapis diversus (see *Lancet* 1802), to which was sometimes added a small quantity of the essence of lead. He speaks liberally of leeches, and sometimes he put a small Venus on the temple or behind the ear.—(*See Mackenzie's Ophthalmia*, Milano, 1802.)

Perhaps the best mode of putting an immediate stop to the Egyptian ophthalmia, when it prevails extensively in a regiment in garrison or barracks, is to put the men actually affected into a detached hospital in a considerable distance from the rest of the camp, which should be dispersed as much as possible in woods, hills, and villages. Egyptian ophthalmia is a disease which makes great progress only when large numbers of persons are either exposed together to the epidemic cause, which first, give birth to it, or to the means which occasion the disease to be communicated from one individual to another, as when soldiers are crowded together in the same building, using the same towels and water, &c. Nevertheless the epidemic first and last proved that the disease did not spread in the French army, after the return of several soldiers from Egypt to France, though these were very much with their comrades in hospitals and barracks, the same security did not extend to the British troops of an army of occupation in that country in 1805, who were threatened with a very extensive prevalence of the Egyptian ophthalmia among them, but which was very happily checked by attention to the principles above specified, and in which Sir James Grant, the head of the medical department of that army, had the greatest confidence.

In the cases under Sir P. McGee, local application with fluid extract of stramonium. During the inflammatory stage, however, this granulation also had recourse to antiphlogistic means, such as dry bleeding, venesection, &c. The topical treatment was at first more delicate than freely and repeatedly applied near the eye. For while there was much remaining action, instead of leeches, which caused too much irritation, fumigations with a weak decoction of poppy heads, and a little laudanum, were used. A weak solution of acetate of lead and sulphate of zinc had the most good effect when applied to the eye. The worst features of opinion did not answer the expectations contained in it. But of all the remedies, the best remedy, which was found most frequently successful, it was suggested by means of a caustic of potash, and was first weakened with twice its quantity of lead. The red precipitate, well levigated, and mixed with equal weight, sometimes answered when the arg. being refused, failed. Well-diluted verdigris, and a weak medicine called the golden standard, proved also some success.—(*P. 41-42*.) According to Sir P. McGee, history behind the ears, and upon the neck are useful; but harmful when put near to the eye. In cases where the disease seems to meet with some success, and absorption has commenced on the external surface of the cornea, this granulation appears of the clearing the operation frequent by a posture, as alluded by Mr. Waddington.

When the violence of the inflammation has subsided, Mr. P. McGregor recommends the use of Bates's mucous-eyed water, diluted with five, ten, or sixteen times its quantity of water. But the strongest collyrium, from which he can most good derived, was a solution of the viride of silver, in the proportion of half a grain to every ounce of distilled water. In some cases it may be used stronger.

Tepid water sometimes proved serviceable in removing the action of the complaint.—(P. 26, 47.)

Paralysed Oculobility of Infants. Dr. Vetch describes the external appearances of this case as not materially different from those of the paralysed oculobility of adults, but he states, that its nature is considerably modified by the more delicate texture and greater vascularity of the parts affected; and the more intimate connection subsisting between the vessels of the conjunctiva and those of the sclerotic coat. Hence, he says, the inflammation is sooner comprehended in this case, and sleeping and blinking of the eyelids occur earlier in infants than adults. When the disease ceases, the inner surface of the palpebra becomes anastomosing, and this diseased surface, when the eyelids are opened, forms an extensive fleshy tract, beyond which the relaxed conjunctiva of the eye cannot be retracted as a second; and often the externally fleshy folds add still farther to the valvular appearance which the part presents.—(On Diseases of the Eye, p. 226—228.)

According to the late Mr. Ware, the principal difference between the paralysed oculobility of infants and that in adults, consists in the difference of the tunica conjunctiva: in the former, externalizing the quantity of water contained within the eyelids is often profuse, the inflammation of the conjunctiva is rarely considerable, and whenever the tumor becomes impaired, it is rather owing to the lodgment of such matter as is thus in inflammation; a statement which appears to me very questionable. But in the paralysed oculobility of adults, the discharge is always accompanied with a violent inflammation, and generally with a hæmorrhagic of the conjunctiva, by which its membranous appearance is destroyed, and the cornea is made to come in contact with the eyeball.—(Ware on Ophthalmia, p. 25.) In children, the effect of the eye is considerably accompanied with symptoms on the nose, and with marks of a scrofulous constitution.—(See Ware, p. 138, &c.) The only inference to be drawn from this fact is, that scrofulous as well as other children are liable to this disorder of the eye.

The following is the treatment recommended by Mr. Ware. If the disease be in its first stage, the temporal arteries are to be opened, or leeches applied to the temples, or neighbourhood of the eyelids, and a blister put on the top of the head as temples. The child should be kept in a cool room, not covered with much clothes, and, if no discharges prevail, a little starch or amaranth in spray of water should be prescribed.

A surgical, however, is seldom called in before the first inflammatory stage has ceased, and an immense discharge of matter from the eye has commenced. Of course, says Mr. Ware, no violent applications must generally not be used. On the contrary, anastomosing and coarctate are less readily indicated, in order to induce in the vessels of the conjunctiva and eyelids their original tone, to rectify the relaxed and flaccid appearance of the lining of the palpebra, and thus finally to check the morbid secretion of matter. For this purpose, Mr. Ware strongly recommends the open conopsea of Bates's Dispensary: B. Caput scutellæ, balsam. 32 grs. Camphor 21 M. & F. pulvis de aqua rosæ 3j. in aqua bullientis 3ij. anate ad usum, et instillat foveat. Mr. Ware, in his late Remarks on Paralysed Oculobility, 1835, observes, that he usually directs the aqua camphorata, as follows: B. Caput scutellæ, bals. anser. 4 & gr. viij. Camphor 3j. q. Miso, in affund aqua bullientis 2viij. Clav. levis in frigida, effusula bullientis li q. v. et superadd. pulvis piceus lior anseris et pulvis. This remedy possesses a very styptic quality; but, as directed in Bates's Dispensary, it is much less strong for use before it is diluted; and the degree of its styptic must always be determined by the peculiar circumstances of each case. Mr. Ware restores consciousness about one drachm of it to be mixed with an ounce of cold clear water, in a medium or standard,

to be strengthened or weakened as occasion may require.—(P. 163.) The remedy soon be applied by means of a small ivory or pewee syringe, the end of which is a blunt pointed cone. The extremity of this instrument is to be passed between the edges of the eyelids in such a manner that the medicated aqueous may be carried over the whole surface of the eye. Thus the water will be entirely washed away, and most of the styptic qualities left behind to anastomose and diminish the excessive discharge. According to the existence of matter, and the rigidity with which is associated, the strength of the applications, and the frequency of repeating it, must be regulated. In mild recent cases the lotion may be used clear or twice a day, and rather weaker than the above proportions; but, in inveterate cases, it is necessary to apply it once or twice every hour, and to increase its styptic power as progress; and when the conjunctiva is somewhat relaxed, the strength of the lotion may be increased, and its application be less frequent.

The reason for a frequent repetition of the lotion just considered, is, that when, the discharge, of the most singular nature. Until the conjunctiva is somewhat dried, and the quantity of the discharge diminished, it is impossible to know in what state the eye is; whether it is more or less injured, totally lost, or capable of any relief. The continuance of a solution of the sight frequently depends on the space of a few hours: nor can we be relieved from the greatest uncertainty, in these respects, until the patient becomes visible.—(Ware, p. 145.)

This author recommends the use of emollient ointments, which must have a tendency to increase the softening and relaxation of the conjunctiva. It perhaps not perfectly, he particularly recommends such as possess a thick or cold and lax property; as an extract of the bark of milk, mixed with olive oil, and an equal part of aqueous solution, or an aqueous powder. This is to be put on cold, and frequently renewed, without omitting the use of the injection.—(Ware, p. 145.)

When the eyelids are adherent together, that they cannot be spread after being washed by any length of time, the adhesive matter must be softened with a little rose water mixed with warm milk, or by means of any other soft emollient liquor, after the practice is taken off, and before using the lotion.—(P. 145.)

If the eyelids of the eyelids only occur when the child does, and then goes off, nothing need be done in addition to the above means. When, however, the eyelids are swollen, the injection must be repeated more frequently than in other cases; the eyelids put in their natural position after its use; and an attendance directed to hold on them with his finger, for some length of time, a compress dipped in the diluted aqueous camphorata.—(P. 146.)

In some cases, when the inside of the eyelids has been very much inflamed, the tunica thickens, increased between the eye and eyelids, has been useful. If, after the eyelids are washed, any part of the cornea should be opaque, the anastomosing, hydrant, or mixed, mixed in a spoon, and applied repeatedly on the spot with a fine hair-pencil, or Jones's ophthalmic cement, broiled and used in the same manner, may produce a cure, if the opacity be not too deep a kind. When the local disease seems to be kept up by a bad habit, attention should be directed, particularly the black sulphur of mercury, or small doses of calomel.

The treatment recommended by Dr. Vetch is as follows: if the inflammation have not extended to the conjunctiva of the eye, its further progress may be checked by covering the surface to a healthy appearance, and washing the eye with any mild collyrium. Leeches are recommended throughout the whole course of the complaint. On the first accession of the inflammation, the best effect will often be produced by the application of a small portion of anemone, composed of half or better 2vi, and a gr. of the red vitals of mercury, without any water. As the disease advances, the liquor should be changed, he says, with the following: less anastomosing than in other instances of paralysed oculobility. For preventing the separation of any strength, he recommends a solution of the vitals of silver, and for curing the relaxed state of the conjunctiva, a solution of alum, or of the sulphate of copper.—(On Diseases of the Eye, p. 235.)

The *pusillit opthalmia*, arising either from repression of gonorrhoea, or from the undetected escape of gonorrhoeal matter to the eye, is said to produce rather a swelling of the conjunctiva than of the eyeball, which is followed by a discharge of a yellow gonorrhoeal matter, similar to that of clap. The heat and pain in the eye are considerable, an increase in light occurs, and in some instances, an appearance of hypopyon is visible in the anterior chamber of the aqueous humor. When the conjunctiva proceeds from the second cause, it is described as being less active than when it arises from the first. However, by such distinctions (Parr, *Treatise*, &c.) as have been suggested, instances of pusillit opthalmia excited in the second way, the disease is said to be remarkable for its degree and intensity. The rarity of cases of pusillit opthalmia from the application of gonorrhoeal matter to the eye, seems supported by such a mass of evidence, that I believe the fact must be admitted. Yet, from comments recently published by Dr. Vesich, it would appear, that the frequency of this mode of infection must be very much lowered by the circumstance of the matter taken from the urethra not being capable of communicating the disease to the eye of the individual by whom such matter is secreted, though probably capable of doing so in the eye of another person.

In the next way the urethra cannot be affected by the application of matter taken from the pusillit eyes of the individual in whom the suppurative is made. At least, of these circumstances there is a negative proof in some facts recorded by Dr. Vesich. "In the case of a soldier, received in a very advanced stage of the Egyptian ophthalmia, in whose destruction of the cornea had to a certain extent taken place, I had occasion to represent the possibility of diverting the disease from the eye to the urethra, by applying the discharge to the latter surface. Accordingly, some of the matter taken from the eye was freely applied to the urethra of the soldier. No effect followed this trial which was repeated in some other patients, all laboring under the most violent state of the Egyptian disease, and in all the application was perfectly innocuous. But in another case, where the matter was taken from the eye of one man laboring under putrid catarrhes, and applied to the urethra of another, the pusillit inflammation of the urethra commenced in 20 hours after ward, and because a very severe attack of gonorrhoea. From the result of these cases (says Dr. Vesich) I could no longer admit the possibility of infection being conveyed to the eye from the gonorrhoeal discharge of the same person. Some time after this, the impossibility, or rather impossibility, of this effect was rendered decisive by an hospital assistant, who conveyed the matter of gonorrhoea to himself, without any affection of the conjunctiva being the consequence."—(*New Phil. or Dictionary of the Eye*, p. 242). Hence, this gentleman is led to refer the connection between gonorrhoea and ophthalmia on the same person, to possibility of contamination; but the disease on which this opinion rests, by limits will not allow me to elaborate.

If it be actually true, in adults, a species of pusillit opthalmia does originate from the sudden suppression of gonorrhoea, are we to consider the complaint so profound as a metastasis of the disease from the urethra to the eye? This opthalmia does not regularly follow the suppression of gonorrhoea, nay, it is even a rare occurrence; also, when it is decidedly known that the pusillit opthalmia has arisen from the infection of gonorrhoea, scarcely, in those instances in which the matter has been minutely examined in the eye, it appears that such an affection of the same nature, so produced, is different from the one already so known to it in manner as its progress, and less distressing in its aspect. When the eye is affected, the disease of the urethra is not always suppurative.—(*New Phil. or Dictionary of the Eye*, p. 238). Hence, there is great reason for supposing that the metastasis takes place in this species of pusillit opthalmia, supposed to be connected with a suppressed gonorrhoea; but we must be content with saying that, if it really has such a source, a distinction from a sympathy prevailing between the urethra and eye; and that the difference of intensity in different people, is the reason why it is not an inevitable consequence of the sudden stopped of gonorrhoea.

The injection of water into the conjunctiva of a foreign into the urethra, and the application of some plasters to the perineum, with a view of inducing the discharge from the urethra, form the essence of the practice of those who place benefit where it is the suggestion of gonorrhoea being the cause of the complaint. The rarity of the occurrence, the frequency of the violent emission of the urethral discharge, the possibility of an opthalmia arising as well in and from, these means as in any other, finally independent of the other complaint, cannot fail to raise in a convincing mind a degree of doubt concerning the validity of the assigned cause. Besides, admitting they still is a sympathy between the urethra and eye, how can we be certain whether the suppression of gonorrhoea, be the cause or the effect of the opthalmia, supposing that the one causes, and the other commences about the same time? Attributed by such authorities, I am inclined to distrust symptoms from adopting any means calculated to remove a discharge of matter from the urethra. When the pusillit opthalmia, is a violent disease, indubitably occasioned by the urethra, and infectious of gonorrhoeal matter, applied artificially to the eye, no one has recommended the summary and improper practice.

The first indication in the treatment of the disease from either cause, is to regulate the violence of the inflammation, and thus limit the destruction of the eye and opacity of the cornea. A copious quantity of blood should be taken away both rapidly and gradually; and leeches should be applied, and leeches applied to the nape of the neck, or temples. The eye must be as often furnished with a decoction of white poppy heads, and washed with repeatedly repeated between the eyelids. To prevent the pain from becoming aggravated during sleep, the opthalmic catarrh should be assuaged on the margin of the lids every night.

When the heat and pain in the eye, and the inflammation, have subsided, when no abundant discharge of pus has commenced; all topical remedies are to be relinquished, and a collarium of any, such as emollient hydrarg., any, must gr. j. used in their place. In some cases, that in the opthalmia originating from the inflammatory constitution of the matter of gonorrhoea to the eye, applications in the form of ointment, such as the em. hydn. and resin's, which might be added the ung. hyd. nitrat., and more than find remedies.

Inflammation of the Eyeball is general. From cases in which the eyeball is at first chiefly affected, I pass to the consideration of inflammation, so terminating in the eyeball itself. As Desmarres, remarkably is only very seldom that the whole of the cornea is more affected with genuine idiopathic inflammation, without any part of its surface being spared. Although this kind of opthalmia is far more frequent than common inflammation of the iris, it is much more rare than the same disorder of the eyeball. For the most part, healthy inflammation of the eyeball has a limited point of origin, from which it spreads, sometimes quickly, sometimes slowly, over the whole eye. During an exceedingly violent, when throbbing pain, affecting not only the eye itself, but extending to all the surrounding parts, the humor of the iris, and within the head, the white of the eye becomes reddened and a watery redness, which, on anterior examination, is found to be seated not only in the conjunctiva of the eyeball, but also in the sclerotic, and to reach it from a very thin vascular network, which, as the ophthalmic probe more and more, assumes the appearance of a web, then, forming all round the eyeball a watery redness prominent fluid, which has a very firm feel, and is as tender, than when applied to the greatest growth, the patient cries out in agony. The consequences of this disease continued to be more and more covered by this increasing swelling of the conjunctiva, and at length only a portion of its cornea remains visible. At the same time, the pupil is very much contracted, the iris is immovable; and though vision is nearly or entirely lost, the patient is scarcely disturbed by day light, or even before the eye. When the iris is naturally grey or blue, it turns greenish, and when brown or black it becomes reddish. Every movement of the eyeball and every effort is suspended, and the whole left from patient as if it were now dead, which, then, after, is to verify the name, because the whole of the eyeball, and

and merely the conjunctiva is enlarged, and to project like a flap of raw flesh farther and farther beyond the edges of the palpebrae, and completely fill every part of the orbit. While the eyelid enlarges, the cornea always loses its transparency, and the inflammation spreads to the eyeball, the lower one at last becoming swollen by the exudate, and first thickening of the parts behind it, and the upper one phlegmorizing the most superficial vessels of phlegmorizing inflammation. The secretion of tears and mucus is now entirely suppressed, and of course the eye becomes very dry. At the very commencement of this violent form of ophthalmia, the conjunctiva is disturbed by a severe attack of inflammatory fever, and terrible symptoms are not infrequently seized with delirium. Here, says Beer, terminates the first stage of this very dangerous disorder.

When the disease is left to itself, suppuration comes on, attended with fever and constant throbbings; the swelling of the sclerotic conjunctiva undergoes a remarkable increase, and assumes a dark red colour at the same time that it becomes softer. The eye becomes irregular, thickening, and when the eye or eyelid is touched, of a burning description. At a certain secretion now begins to take place from the Meibomian glands, the eyelid conjunctiva has a more solid appearance. The upper eyelid has a purple hue, and, on account of the continually increasing size of the eyelid, is pushed further and farther outward. The portion of the sclera, still discernible in the middle of the protruded conjunctiva, acquires a fiery redness, which afterward changes to yellow. The patient feels as oppressive sense of heatiness in the orbit, and a disagreeable kind of confusion all round the eye. At length, the throbbing and tension are so agonizing, that the patient often expresses a wish to have the eyeball extirpated. If an efficient treatment be adopted, the eye now bleeds, and a mixture of water and blood, together with the scanty perspicuous remains of the tears and vitreous humor, is discharged with considerable force in some degree in front of the patient: an occurrence, sometimes mixed with or mixed with. From this moment, the pain all at once subsides into a very moderate feel of burning in the eye, and suppuration goes on until all the texture of the organ is exhausted, the orbit has an empty appearance, and the closed eyelid sink into a cavity. There ends, as Beer observes, the second stage, after which follows a general induration. But he remarks, that the course of the case is quite different when it has been properly treated in its first stage with astringents, or exposed to the ill effects of Muscovy smoke, the discharge of pus, improper diet, immoderate exertion, &c.; for, under the operation of these unfavorable circumstances, the second stage may commence with almost no symptoms marked, every vestige of the vegetation of the eye disappearing, and the parts at length subsiding, while the aqueous humor is retained, and, unless efficient medical aid be promptly given, the patient loses his sight.

With respect to the onset of such an attack of the whole eyelid, as soon by common inflammation is a heavily edged, they resemble of an exceedingly violent suppuration, such as is given by a carpenter, burn, and become either of a mechanical kind, or arise both from a cold and mechanically together: a vulgar theory fully proved by the foregoing cases.

The following are the observations, which Beer delivers on this progress.—While, in the first stage of this inflammation of ophthalmia, the eyelid yet remains, and the eyeball itself is not enlarged, if the patient can be properly taken care of, every hope may be entertained of dispersing the inflammation so far as that, with the exception of a weakness of sight, or longer or shorter inflammation, as it often will be. It is to be observed, however, that under these circumstances the patient should not be too bold in preventing a perfect cure; for the very commencement of any inflammation of the whole system, even when the disease is partly abated, is attended with great pain, and may, in the progress of the disease, be attended with more pain, but only in proportion to the loss of the eye itself being destroyed by the most painful means: and when things turn out worse still, a tolerably tolerable irritation of the eye is necessary. But as soon as the process of drying is begun, the eye, nearly closed, and the eyelid phlegmorized, it will be no wonder if the inflammation can be

resolved so as to preserve the shape of the organ; for the restoration of the eye is entirely out of the question. But besides the irremediable loss of vision, the disorder under these circumstances always produces a greater or less change of the pupil, which, however, has no share in causing the blindness.

In the second stage of the case, of course, the hope of restoring vision is quite past, and if the eyeball is still, and not merely the conjunctiva, has been considerably swelled in the first stage of the case, the chance of preserving the natural shape of the organ is extremely suppressing. But when the eye forces the latter desideratum is impossible. If the first stage should have been so violent as to induce gangrene, the practitioner will have enough to do in preventing sphacelus and death; the danger of which is considerable, on account of the aggregate connection between the eye and parts in the orbit, and the brain and its meninges.

In the first stage, antiphlogistic treatment, in the general sense of the expression, is indicated, and the case is not to be regarded merely as a local disorder. However, with respect to topical bleedings, the surgeon, says Beer, should be more active than in other varieties of ophthalmia, and, after copious venesection, and the use of leeches have produced some relief, the protruded conjunctiva about the cornea should be deeply scarified with a lancet. If in the first stage delirium come on, as it sometimes does during the violence of the inflammatory fever, Beer directs one of the external jugular veins to be opened; or blood might be taken from the temporal artery.

In the second stage of the case, when the re-establishment of vision is quite impossible, and the efforts are to endeavor to keep the eye of a good shape, and quickly break the suppuration, when suchness positions, and particularly those made of apples, are the applications on which Beer bestows his pains. This topical treatment is to be mixed with internal means, as explained in the preceding pages, because the disorder is attended with general disturbance of the constitution. When matter is fully formed, and its evacuation can be distinctly felt, Beer approves of opening the abscess with a lancet: for it is only by this means that the resolution of the eyeball can be prevented. If the eye has already burst, the preservation of its form is no longer possible, and according to Beer, both the topical and general treatment should be guided by its state of resolution. When gangrene is formed, the practice ought to conform to the principles explained in the article Mortification.

External Ophthalmia. Inflammation of the Outer Coat of the Eye. *Ophthalmia externa superficialis*, of Beer. The inflammation of this common species of ophthalmia, as the name implies, occurs, has a variety of names applied to it, as, *ophthalmia levis*, *ophthalmia angularis*, *serena*, and sometimes *chronica*, and *ophthalmia rosea*. Together with a partial dryness of the eye, and a secretion as if the eyelid were compressed on every side, the white of the eye becomes covered with a general redness, which, though it affects both the sclerotic and the conjunctiva, will be found on attentive examination to be much more considerable in the former than the latter system, in which only a delicate point of inflammation is at first perceptible. The motion of the eye and eyelid are not remarkably prevented; yet the patient never moves these parts, except when he is actually obliged to do so, on every motion of them, if not actually painful, produces a good deal of uneasiness. Though the lower eyelid be not so loose, as the upper, its clearness is always much diminished; and this change in the position of the eyelids of the eye appears. These effects, which occur almost simultaneously, are followed by pain, which increases every moment, at first extending over the whole eyeball, and then to the surrounding parts, and to the top of the head. As the pain grows more severe, every movement of the eyelid and palpebra becomes more distressing; the dryness of the eye increases, and the relaxation of the sclerotic conjunctiva appears either more slowly or quickly, according to the degree of inflammation, until the network of blood vessels, which was at first distinguishable, gradually disappears and the conjunctiva forms a mass of red clots, quite concealing the sclerotic, and forming round the cornea a very painful, firm, and thick, opaque projection. Thus the cornea seems as if it lay in

a depression, with its margin partly covered by this inflammatory swelling of the conjunctiva. At the period when the proliferation of the latter membrane takes place, the cornea itself always becomes less and less clear, and of a milky gray colour, so that neither the iris nor the pupil can be any longer distinguished, and the power of vision is reduced to a faint perception of light. The pain, which was that of laceration and tearing, now becomes of a throbbing description, and the eyelids, which were before in part taken up in the efforts of the inflammation, are no longer capable of contracting properly the eyelid conjunctiva. The eyelid and eyelids are perfectly insensitive; and if it attempts to move by the patient's own efforts, the efforts of the muscles may be perceived, but still no movement of the parts intended is performed. The cornea looks as if it were too much for the eye, and the inflammation inflicts a severe attack of inflammatory fever. Thus, says Rees, does the first stage of phlogosis of the eye gradually rise to its highest degree, to which he applies the name of *pan ophthalmia*.

However, it is observed, that suppurative external ophthalmia does not always become so violent; on the contrary, when the complaint has been excited merely by the lodgment of some small foreign body under the eyelid; by touch, in such a case, the conjunctiva and cornea are both relaxed together, yet even when much is affected, if no other sources of greater irritation intervene, the inflamed does not readily increase so as quite to conceal the cornea, or to be attended with an extraordinary swelling of the eyelids. This milder form of external ophthalmia has sometimes received the name of *serena*. It is the mild state of ophthalmia of Scarpa, characterized, as this author says, by redness of the conjunctiva and lining of the eyelids, an unusual sensation of heat in the eyes, itching, itching, and itching pain, as if sand were lodged between the eye and eyelids. At the place where the pain seems most severe, Scarpa remarks, that some blood-vessels appear more prominent and larger than other vessels of the same class. The patient keeps his eyelids closed, he is full of weeping and sobbing in speaking them, and by this means he also moderates the action of the eye, so that he cannot expose himself without increasing the burning sensation, increasing pain, and effusion of tears. If the constitution is tranquil, the pain will be a little alleviated, particularly towards the evening; the skin dry; and sometimes slight shiverings and nausea and sickness take place.

According to Scarpa, mild acute ophthalmia is often the consequence of a cold, in which the eyes, as well as the primary cavities, fauces, and trachea, are affected. It is not infrequently occasioned by changes of weather, and sometimes arises from cold to cold, the prevalence of easterly winds, passing through damp, alkaliating, muddy countries, in the hot season of the year, exposure of the eyes to the cold rays of the sun, draughts of cold air, dust, &c. Hence, it does not come extraordinary that it should often make its appearance in an epidemic, and affect persons of every age and sex. As additions to the list of remote causes, authors enumerate the suppression of some habitual excretion, as bleeding from the nose, or puer, the venesection, &c. a disordered state of the primæ viæ, worms, dentition, &c.

Between *serena* and more law writers, there is still some point of difference in their descriptions of external ophthalmia, or else they name different cases; for while Rees represents the redness as affecting the sclerotic or first more than the conjunctiva, other writers describe the affection of the sclerotic as generally second, or even it happens or all, the according to modern observation. It is not unaccountably often an epidemic form of an effusion simple inflammation of the conjunctiva.

At the second stage of external ophthalmia comes on, the symptoms are something in the degree of the complaint in its first stage, but when, what Rees calls a true *chemosis* is produced, the following are described by him as the usual appearances. The circular prominent fold of the conjunctiva round the cornea becomes of a dark red colour and the swelling increases, but it becomes softer and less painful. The hardly visible portion of the cornea, situated in the depression formed by the circular protuberance of the conjunctiva, seems at first perfectly white, and afterward yellowish, being

the seat of more or less purulent matter. Though the second conjunctiva is every where increased, still a thin white membrane, this secretion, says Rees, is very so copious as to run over the face, at the third stage of the disease. In the early of the first stage is noticed considerable effusions, in consequence of its being becoming more evident. While suppuration is taking place in the system attended with the whole conjunctiva which usually accompany the symptoms of acute ophthalmia, little collections of matter sometimes occur at different parts of the conjunctiva, and also they have hard, a probe may easily be pushed under deeply into them without any painful pain. (P. 1, p. 412.) The suppuration continually increasing, the swelling of the conjunctiva, and of the whole eye ball, now diminishes, the effects of the inflammation penetrate deeply into the cornea, and the cornea of the eye is so altered as not to be recognisable, the part whitening up, as Rees says, into a substance which is hard. However, sometimes in the early stage deep effects of suppuration are sometimes produced only in a certain part of the eyelid, especially when the situation is the conjunctiva, or in the external injury; and in the meantime the rest of the conjunctiva of the globe of the eye retains its natural organization, while in the part above stated there is a funnel-like depression, attended with a considerable discharge in the case of the eye.

But, says Rees, when an idiopathic external inflammation of the eye has only attained the third degree expressed by the term *serena*, he, he knows, that the complaint is principally owing to the influence of some extrinsically or internally existing substance under the eyelid, the nature of the conjunctiva and sclerotic substance a remarkable increase in the amount of the second stage the first of that stage becomes more or less marked; the eye is not much enlarged, and the conjunctiva is more or less inflamed; but at the point where the extrinsic substance lodged, an open superficial suppuration occurs, and, according to Rees, the case, both in the first and second stage, is generally accompanied with no other symptoms.

In the first stage, Rees represents the progress to be very disagreeable, provided the disease does not extend that degree to which the name of *serena* is applied, for with the aid of proper treatment the inflammation, when of a healthy kind, may be soon and successfully removed, as not to leave a vestige of a mark. If the cause of the disease be not given that a permanent injury or wound of the eye, the inflammation of the whole eye, perhaps, will remain, but stoppage, as does in the inflammation *serena*. In the other hand, when this kind of ophthalmia presents itself in the form of true *chemosis*, the prognosis is seldom and the worst is made with great safety, especially when the patient is of a weak irritable constitution. A third very common and unaccountable, or a variety of following strictly the advice which the constitution has actually afforded; for under these circumstances it will not be in the power of the doctor to prevent the inflammation decreasing spontaneously in its second stage, so that even the inflammation of suppuration will be incalculable. But if these inflammatory conditions are not present though the present symptoms are not present, they may have caused a vision and when in its highest degree in the first stage, and that the eye may be saved by proper and judicious treatment, but also the opposite; one will the most be difficult cure when the cornea continues for some time destroyed by transparency, and the power of vision impaired to a slight various affection of the conjunctiva remains. These effects, says Rees, at length, somewhat frequently, how in consequence of the aid of modern medicine, a proper regimen, the patients and even some of the best do not die.

The progress in the second stage, is under very different circumstances; for, as Rees observes, though the inflammation in the first stage may remain without that degree which is implied by the term *serena*, yet if any irritating point succeeded by some, with the possibility may be not efficiently treated, it will be very likely of substance already produced by the injury itself, a more or less suppurative white excretion will remain on the cornea, and cause a permanent impediment to vision in a degree depending on the situation and extent of the opacity. And in addition to the

1906, it is to be remembered, that if the corresponding points—strictly understood, or extremely nearly so—of various or numerous parts be penetrated by a substance, and, in the first case, a prototype of the life or pattern of the system in the current (organic whole), a disengagement in the past, or an irregularity of the system, be produced; which, in the second, the disengagements may be a partial wandering away of the system, attended with loss of sight and of the natural shape of the part.—*Ibid.*, p. 176, 871.)

These lamellar structures, that when this species of a polychaete larva is still in its first stage as the *Stomatopoda* larva, are the beginning of the second stage in early metamorphosis. For when the *Stomatopoda* is eventually transformed by superaddition, the apophysis and its lamellae acquire the form of the coracoid, and for the first time, and in the beginning of the time can be observed a connection with the main lamellae of the coracoid. But when the middle portion of the lamellae is cut off by the connective, toward the apophysis, the idea of a possible change in the evolutionary history of the superaddition, of an idea of the origin of the apophysis, and the lamellae, will be very successful if he can find evidence to indicate that the migration, which corresponds with a great deal of physical adaptation. An extraordinary relationship of the connective of the lower coracoid and a posterior coracoid are the two main distinctive effects of the migration of the eye, but produced. Lastly, they indicate that the changes in the lamellae of the eye, that is to say, the changes in the superaddition of the eye, is easily explained, that the most remarkable consequences, that the apophysis and origin of the apophysis are produced entirely due from metamorphosis.

—(P. 1, p. 108)

As a result, we conclude that the treatment of idiopathic severe optic atrophy as a modification of aqueous humor formation, of the neovascular, mild acute optic atrophy as a steroid, and severe acute optic atrophy with steroids.

According to Mr. Tracey's simple refraction of the cornea, and without effecting what injury of the eye, and without depending upon any extended disorder of the system, not assisted by a morbid diathesis, may be easily and speedily relieved, even to its most acute form, by bleeding, and more brisk doses of mercury mercurial ointment, or *Unguentum of the Dispensary of the Disp.* 2, 361. In the case of cold acute ophthalmia, foreign, irritable low light, gentle purgative, foreign mercurial low light, gentle purgative, with mild repeated doses of mercurial ointment, the removal of any extraneous body lodged under the eyelid, and frequently washing the eye with warm decoctions of mulberry-leaves, and rubbing with a very mild pomatous ointment, directed to a free state of the eye. Mr. Tracey also expresses his decided preference to a dry application to the partially acute state of inflammation, and considers it more useful when generally better than indicated, than the aqueous solution of opium, or infusion of poppy seed extract.

When the disease proceeds itself to its first stage, in the cold state of tissues, says Barz, it usually terminates with an erysipelas, accompanied with an enormous suppuration, and may be cured by energetic antiseptic treatment, in which, indeed, since the system itself is affected, particular attention must be paid to lowering the action of the liver and all upon the organ. But when a true diphtheria is present, every antiseptic remedy must be promptly and vigorously put in practice, internal as well as external, remedies being employed, and besides disease treatment, the physicians, would the system it to be disturbed, a proceeding never necessary in the case of diphtheria. Such considerations, Barz observes, have a wonderful effect upon patients, practiced in the proper period, after consumption and rapid healing with little have been fully put in operation, and when the case is under way, as in a profuse immediately a profuse discharge of blood.

"By the action of such antiseptics (says he) I have cured the inflammation and all the threatening effects, such as it were, which may have, when an initial cold state is followed by other symptoms."—(6, 1, 2, 188.)

In this country, the best practitioners rarely make mistake either in nature of the condition or treatment, and have more confidence in general than local treatment.—(Walton; *Notes Pract. Med.* of the Brit. M. S. 2.)

ON the application of the experiment of ether, or of the
Yon. II.—Q.

points of reference to the eye and eyelids. So the relief is dramatic, as recounted by Mr. Ware (p. 54). I shall say why this eye surgery with all its risks merits the appreciation of such first-hand witnesses.

Manuscript has been received, having taken a part in the first stage of the work, by manufacturing negatives of the original dissections, and after the positive printing is done, according to the directions given in a copy of this article. In the first stage of several acute ophthalmias, *Serpula* resembles the glass (solid) applications to the eye seen in *Conio* and in *Indur* (noted in next article), but is not as hard as the latter, and is a much lighter color. It is made to distribute human hair. Careless of this treatment should be repeated at least every two weeks. The patient should be directed to consume, before going to bed, and to go with his head in an elevated position. In the case of a child, sitting up in the night, the application is proper. When ophthalmia is accompanied with a violent pain in the head, the hair *Man* is indicated, a strong decoction of *pepp* made as a preparation.—P. 51.

[illegible]

Widely distributed, the good effect emphasized in the second series of experiments by the application to the tip of the beak of groups of the vibro-motor of 14 Hz, much or twice, a day; a subject already examined in the first series of experiments. The quality of feeling of eye is indicated in the last column as being best in most cases; it is indicated, a case of great improvement, that no further improvement, but here, doubt, because that have already resulted upon the general observations.

When idiopathic myofascial dystrophy has increased a supposition of little value. Beebe speaks largely of the strength derived from a section of the lips down to (see *Leontopitium Dugesi*), considering the larger vessels of the vessels, as first stating the supposition, but with a full illustration. In some cases, Beebe says, that when such local treatment is combined with the liberal exhibition of boric acid and mercury, and diet and regimen conducive to the support of the nervous system is very great. And here, again, it is worth observing, that while the strength of the jaw muscles is of great service in the several stages of the disease, it is more of the importance in the kind of disease which antithesis (purulent) epithelioma, especially if not blooded with mercury, and even when these combined, it cannot be entirely by weak and unstable subjects, affected with the latter complaint; it is not observed in other instances of disease. (*B. v. 481*).

When particles or elements in the applied conjugate pass around the column, a free radical on the matrix can be immediately made inactive if there is a suitable site for it to be set down, as Berc and others, in the next mill second extensively, and the crystal will be in danger of being destroyed. For this reason if the method involving the oxidation of the lower crystals, somewhat resembles as a consequence of the direction, see

information of the situation. The results, except in cases of bilateral, according to the degree of the eye first or directly affected, patients, I think, to be clearer views of the subject, and perhaps gain. One circumstance particularly observed is both

words in nearly straight lines from the posterior part of the eyelid, and extending along the inner side of the tarsal opening, passing over it, not far from the pale circle around it, which is so seldom when either the closed or the eye is affected. When the vesicle is closely examined, the general impression is of hard polished ivory by numerous small ramifications upon a few large trunks. There is *temporarily* a little swelling of the conjunctiva which sometimes forms a slight but constant ring round the tarsus. In most cases, little change takes place in the affected conjunctiva in the early stage, but in the chronic affections the cornea becomes thick and cloudy. Upon these eruptions, crusts form of the nature of the crusts found on the cornea, but generally to be found on hardened, especially on scars in the cornea. At the commencement of the disease there is often a temporary burning or dryness of the eye, but none of these very severe sensations of itching follow. The eyelids are increased in size very little affected. About the first stage of pain is generally the least, though sometimes, in the earliest stage. Mr. Wenzel describes conjunctivitis usually most severe in the angle of the affected eye, but he says that it is often noted in the lips, the cheek-bone, the teeth, or the lower jaw. — Sometimes the pain is peculiarly confined to one-half of the head, and sometimes there is a severe pain in the cavity of the nose, or in the ear. The pain is often of a dull agonizing kind when alone, and though increasing they vary much in degree, though as it takes in very severe paroxysms, and with great violence when the head is bent downwards. Sometimes the pain is excited by touch, by raising the eye and the patient is unable to rest his head on the affected side or eye, as it is a pillow. In some cases the pain is said to be constant, the patient being so in the evening, continuing during the night, being much worse about midnight, and abating towards morning.

In his system, says Mr. Warder, the patient gradually discharges more of a series of false and dangerous than of pure; and though there is a predominance of cerebral action, the eye does not seem to suffer from excessive light, as in certain forms of disease. The patient is directly opposite to him, at least, in relation to the first stage of the disease. However, these notions, which are in considering the after-effects of generally the chief seat of morbid influences; but these are down the eye as the chief subject to be considered. He admits, according to the second stage, the system is light and even a considerable degree of it. According to Mr. Warder, the morbid condition is always accompanied with more or less sympathetic fever, the paroxysms of which take place through the eye, and the function of the latter is somewhat deranged, the eye being irritated, and the secretion of tears continued in quality. In second stage, the part in the head seems to be more sensitive; the relation of the system increases, the whole white of the eye is covered with blood-vessels, and the conjunctiva is red. At high elevations, sometimes in the nose, through which the aqueous humor is discharged, and the eyelid contracts, when the pain ceases or diminishes, may find within the posterior chamber and even through the sclerotic coat.—Warder, in *Med. Obs. Trans.*, vol. 10. "Two females could not see, owing to the number or white of the vessels existing during severe pain (as) such cases were known to be symptomatic of a small-pox, but both out of the course of the disease. He adds, that they were both very old, and that generally in old persons, the disease is usually subject to the fallacy of the eye, and not of the eye."

The criticism that the oculist's examination was too superficial, was a charge of ignorance, void of any basis in fact, and a gross misstatement of the facts. The oculist's examination was a complete one, and the only one that could be made at the time. The oculist's examination was a complete one, and the only one that could be made at the time.

According to Mr. Waring, this kind of pathology resembles syphilis more than any other kind of inflammation of the eye. There is nothing that is fundamentally different in the general course of the disease com-

enlarged, which is the cause of the redness being generally defined over the whole abdomen, whereas in epidemic dysentery it is in the extreme sigmoid flexure passing along the abdominal wall; they may be the same, which are chiefly applied, and hence the pain may which is always observed between the rectum and the enlarged vessels. Mr. Winslow further explains, that though these diseases resemble each other in the point toward the point, and have various treatments, a strict look at epidemic dysentery always has the constitutional symptoms of dysentery.

When the woman has made much progress, and the symptoms have not yet yielded to more resolute, Mr. Warfield recommends the operation of the syngonium, known as a practice taken up with the most beautiful effect in my development. After the operation, however, it is the only remedy applicable; but if the eye cannot bear it, the same nature of opium is to be used. He gives attention to the side of the biliousness in everything after the same, and speaks highly of the water (not water) added to an elastic, each being taken to supply the needs of the system, and the whole, or other patients. If the face of the eye was suddenly interrupted by a chill just before the attack, the author prescribes a couple of grains of arsenical powder, when, in connection with opium, it is taken every four or six hours. The advantage, he says, is derived from local bleeding and where remission may become necessary on account of the continued presence of the disease, it is to be modified with moderation.

In the early stage, Mr. Wadsworth has found, that the parts of the eye and conjunctiva are sometimes much affected by a conjunctivitis with the development of purgery lesions. He also writes: "Many in the time of the neck or behind the ear; but diagnosis of their being put under the eye itself." The various distinct organs, in fact, in the only local application which he has seen with decidedly beneficial, but the use is to be delivered with a fine cloth of the white material, when all definite symptoms have been subdued. "After the intense sore throats have been treated, the conjunctiva still remains very white, and the pulse quicker than natural." As the state, actual dose of bark, water alone or with the mineral acids, will become more acute. — *Wadsworth*, in *Med. Clin. Trans.*, vol. (6). The outline of Bee's practice has been given very briefly, in the final stage, he applies a decoction to the nasal cavity, and covers the eye with a cold pessaire, notice again, properties of similar in the water with which it is made. Disinfectants are also prescribed. In the several stages, galls, cones, sulphur, strick, antiseptics, lotions to the neck; or behind the ears, friction with oil on the conjunctiva, and covering the eyes with loam of aromatic herbs and camphor, are the means of relief. When attacks of conjunctivitis exist on the conjunctiva, sclerotic, or cornea, a collection of the blood vessels, with a large addition of the blood fluid of veins, is contemplated; or if the vessels are large and on the cornea itself, they may be treated with the large incision for veins of a raised size pencil. After each one of the collections, Bee covers the eye again with the type of ointment for the conjunctiva. — *See Billie on Properties of the Eye*, vol. 2, p. 218. Regarding the last application, I have already expressed my belief, that it is the which is not likely to obtain credit among the scientific community.

Staphylococcal ophthalmia. One of the peculiarities of this case is, that it is usually attended with pain. As Dr. Truick observes, the intense fact is very marked with respect to staphylococcal inflammation in the conjunctiva; it is never there characterized by a distinct of vascularity—(see *Opht. of the Eye*, p. 23, of 2.) According to Mr. Truick, when staphylococcal inflammation of the conjunctiva is not attended by change of texture, it is not limited by any particular local character. "The vascularity is inflammatory. This inflammation sometimes accompanies people of the sclerotic conjunctiva, in which case the vascularity is diffuse, instead of being partial as in pure catarrhal inflammation, and the intolerance of light characteristic of the staphylococcal inflammation is present in a greater or less degree. It accompanies, then, the most secretions of the lids when the eyeball becomes affected by the acuteness and duration of that disease, and the principle of the virus, especially the staphylococcal. In its strongest form, it is almost peculiar to young children, and

tion which we are capable of giving, is contrary to accurate ideas of its formidable nature. The attachment of the stomach to the important structure of the neck and shoulder of the left side, and in so great a degree, is sufficient to indicate its importance and difficulty.

The extensive nature of this operation led us to take the precaution of securing the external jugular vein with a double ligature, and dividing it lower on the neck. Though in operating upon the neck we have several ligaments these veins without any important consequences, we however think we have increased almost (and often from the division of a large vein, and the admission of air into the circulation).

The case of James Daggette's, in which a young woman suffered under an operation, from the division of a large vein in the neck, while he was engaged in removing a tumor, contributed, with my own experience, to make me take the precaution of previously tying the vein in this operation.

It was at length decided that to remove the pericardial gland in an enlarged and swollen state, the first step, which it passed over the base of the lower jaw, was opened in dissecting the ligaments from the trachea, at the early stage of the operation, before a single artery was tied. At the instant this vessel was opened, the situation of all present was arrested by the bursting issue of air issuing into some small opening. The breathing of the patient immediately became difficult and labored, the heart beat slowly and irregularly, his features were discolored, and convulsions of the whole body were followed to so great an extent as to make it impossible to keep him on the table. He lay upon the floor in this condition for some half an hour, as all supposed in artificial respiration. As the convulsions gradually subsided, his mouth was permanently distended, and complete hemiplegia remained to have ensued. An issue and more enlarged before he could articulate, and it was nearly a week before he recovered the use of his first and last. From a belief that these effects arose from the admission of air into the blood vessels, which was not detected by any person present, I instantly failed to make a set of experiments which I made some thirty years ago upon dogs, by blowing air into the circulation, by inserting a blow-pipe into a large superficial vein upon the neck, and was finally struck with the similarity of result.

No severe symptoms of a general or local nature took place to interrupt the process of presentation in the trachea. The trachea was cut, and the lower and upper parts as have been described, only occurred with that necessary complication of great solicitude, until a new apparatus fully established and the great vessels covered by tracheotomy.

No difficulty attended moving his shoulder in a proper position by the use of the external apparatus for drawing clays. With this aid he held about a whole day in convulsion, after five weeks elapsed, and two months from the time of the operation, he was able to discontinue his sleep, and by means of an apparatus contrived by Mr. James Rice, a most ingenious and inventive artist, to supply the want of clays, he was as fit as to have his shoulder in its proper position, at the same time that the full motion of his arm was preserved. — (Rice.)

JOVARIAN TUMOR. The following highly important and interesting case, heretofore, perfectly unobserved, is given by Dr. Daniel L. Rogers of Illinois, in a very great practical importance, that I have concluded it would be acceptable to the profession to have the description of the operation and its result inserted verbatim. Very many are actually falling victims to this disease, who might be preserved by a similar operation.

In July, 1829, I was requested to operate on a woman for pericardial tumor; after drawing off the water, I observed that the abdominal tumor was unusually large, upon examination I discovered a large tumor on the left side of the neck, and extending to the left side. Surgery the following history of its origin and growth. Two years since, in her young days, while in this country, after being two weeks at sea, she had a supposition of the catarrhs, which was soon followed by a sharp lancinating pain in the left hand region, provided in winter, her health had always been good. On finding the pain increased, and the abdomen began

to swell; first on the left, and then extending to the right; the stomach became affected, and although unattended, her stomach acquired her of being purgative.

In consequence of this oppression, the disease was allowed to proceed without any medical advice, until time had extended her fluids in the cavity, when a physician was called, who pronounced the disease a dropsy, and recommended first to be bled.

A large quantity of water was drawn off, but in two months it had accumulated, and the oppression was repeated five times previous to my seeing her. It is supposed that within the two years, sixteen gallons of fluid were drawn off.

I observed in this case, what I have remarked in several others, that the fluid discharged differed from the water in other cases. It is much more transparent; of the consistency of honey; of a milky color, and differs from any other secretion that I am acquainted with. After deliberately examining the tumor, and as for the possibility of its being cured by its operation, at the same time stated the great risk of its attending the performance, and the probability of its recovery. I likewise expressed Professor Hall, who was consulted in this case, to make a similar statement. His good constitution and general health at this stage of the operation, led me to attempt a cure. After the incision, nothing could be done but determination to keep the chest of water which even so desirable an operation might afford, and to the expression, "I would rather die than live in my present condition."

On the 10th of September, she was laid on a table of convenient length, and with a large vessel I commenced making a hole in the pericardial space, carrying it parallel with the trachea, and presenting an oblique position. The pericardium being divided, the fluid was evacuated through the touch of the hand after to the pericardium. This was at first supposed to be much (perhaps, better) a cautious dissection through a membrane in nature to the depth of a quarter of an inch, the water passed out with considerable force. With a pre-dissected lancet, the opening was enlarged in the first part of the external incision, and to our surprise we found that a set was now opened which appeared to be the whole circumference of the abdomen, and at first its attachment appeared enormous, and with it was. It lay in connection with the liver, stomach, spleen, and bladder. By pulling up the set it was found that the adhesions were much looser at first exposed. It was determined, therefore, to detach them from the pericardium and omentum: some of the adhesions were so slight as to be separated by the finger, others by the handle of the scalpel, but the greater part required to be separated by a tedious dissection, and in some parts the adhesions were so close that portions of the pericardial membrane were removed. These adhesions extended for three or four inches around the abdomen. After completing this part of the dissection, the tumor was drawn out and supported by an assistant, and the dissection continued: separating it from the omentum, which required much care, from the large and numerous vessels going to it from this source: the tumor was at least the size of a goose-quill. After occupying two hours in the operation, the huge mass of dropsy was safely removed, and laid on the table. The ligaments were all cut above the knot, and left to absorption. The wound was closed by sutures, dressed with adhesive straps, but, a compress and a bandage applied freely to the abdomen. I place some confidence in the close application of a bandage, as it brings the divided surfaces in contact for the purpose of adhesion, and I believe it is an important auxiliary in preventing inflammation. She was then removed to bed; her state at this time was better, but regular. In the course of the evening, considerable reaction came on, with some heat of skin.

Within fourteen days of the progress of the case, it will be very necessary to add that the case progressed without any untoward symptoms, and in six weeks from the period of the operation her constitution had returned and her health entirely recovered.

The tumor was composed of a large sac, which contained the fluid drawn off in different operations for dropsy. One third of the tumor was solid, con-

present in becoming adherent to the glans. He says he has seen the opening of the prepuce so much contracted, from the inverted skin hanging and swelling, that there was hardly any passage for the water. If the passage in the prepuce, as contracted, be in a direct line with the orifice of the urethra, a bougie must be used. If otherwise, the operation of slitting up, or retracting part of the prepuce, becomes necessary.

When matter is confined inside the prepuce in the manner above described, Mr. Hunter recommends trying the prepuce open from the external orifice to the bottom, where the matter lies, as in a white of onion. However, he thinks the probability of this operation for the mere purpose of applying dressings unnecessary, as the acids may be washed with gentleness by means of a syringe.

I happened to verify my apprehension at St. John's Hospital, at a time when the fashion of calling every phlyosis inflamed or not, was the fashionable; and I had several opportunities of witnessing the irreparable consequences attendant on neglecting these conditions. It gives me pleasure, therefore, to find this villainous practice partly discovered by a modern writer. "It is not so common," says Mr. Treves, "to cut the inflamed prepuce, as it used to be a common part. I lately saw a phlyosis treated by a threatened and rigid state of the membrane of the prepuce during the first two of mercury, consequently with injury, for the use of two weeks, each of the size of a split pea, situated one on each side of the superior fold of the prepuce. It took the system of an enormous suppuration, that thing being, which was thoroughly miserable, would not heal unless the prepuce was freely divided; and separated with the most slow, after positioning for some days, I slit it up. Thereon immediately healed, but the wound so quickly assumed the same hideous and irreparable character which had belonged to the penis, and was now in danger that it would be only a transfer of the disease from one part to another."—(p. 120.) I have not only witnessed this stage, but, in several cases under the late Mr. Hughes, and in St. Bartholomew's Hospital, but have seen no treatment brought on by the still more rash practice of cutting the prepuce, unless when the part was in a state of acute inflammation, or when very acute when it, when the constitution was in a relaxed and very dissipated state from the immoderate and immoderate use of mercury.

The common operation for the cure of phlyosis consists in slitting open the prepuce nearly as whole length in the direction of the penis. This plan is certainly the most eligible when the matter of a phlyosis cannot escape from under the prepuce; leaving continuous, which many surgeons were Mr. Hunter's main line preferred, might not suffice for giving vent to the accumulated pus. In many cases of phlyosis, says Mr. Hunter, an operation is necessary; for while the inflammation is very considerable, such a remote might bring no satisfaction. He acknowledges, however, that there are cases in which a freedom given to the parts would prevent the latter event. When matter is confined under the prepuce, he seems as speaking indisputably; and of the patient should object to the common operation, he advises its opening to be made with a lancet directly through the prepuce, or even with a razor.—See Hunter on the Venereal Disease, p. 352, &c. &c.

When the prepuce is to be slit open, a director is first to be introduced under it, and the division is then to be made with a curved pointed bistoury from within upwards.

Many surgeons object to this operation, because the prepuce contains adherent to a very deranged state, and they prefer circumcision, or excision of the prepuce, in the following manner. The prepuce is first cut off with a pair of forceps, as much of the part being left out as is judged necessary to be removed. The removal is then accomplished by our sweep of the knife, which, directed by the index of the finger, is very of making the incision in a straight and regular manner. A fine silver is next passed through the edges of the lower and upper portions of the divided prepuce, so as to keep them together. The only absorbent dressing is used, and over it a fine dressing.

Dr. Ryan lately mentioned to me a new plan of operating on phlyosis, which is less severe than the common one, attended with no suppuration, and, ac-

cording to this gentleman, very efficient. It consists in drawing back, as far as practicable, the external skin of the prepuce, and then introducing a sponge under to internal epiphyma, and drawing it with a narrow curved bistoury. In some cases, I have no doubt that this method would completely succeed, and remove the surgeon to draw a better name the prepuce, and even to remove the phlyosis without making a cicatrix. The point of M. J. Chappet who merits notice. It consists in cutting the outer surface of the prepuce open to the extent of a line parallel with the foreskin. When this latter part is very short, it is to be divided with the scissors. The incision is made, says this author, because it is more direct than the common one, and scarcely any dressing is necessary.

At the period when I first entered the profession, it was the custom to advise every patient who complained to have a phlyosis. However, now that we are full of any irritation about the prepuce and thus perceive that of common waste, being treated by the plan the complaint is still longer, even the operation has been relinquished, and treatment and caution of the disease are always considered possibly in the determination for any particular method of treatment. Nay, even when phlyosis does not arise during, if there be a great deal of inflammation, the use of mercury may rather do harm than good, and the phlyosis should not be precipitated in its development. On this point I fully coincide with Mr. Treves. "Upon many occasions," says he, "patients are led to suppose to contend with the specific character of the venereal disease, to the neglect of the inflammatory state of the affected parts exhibited above its light. This abuse of administering mercury for such purposes and result, more, accompanied by phlyosis, or an approach to that state, is of common occurrence, and it is far from being recognized by the profession as an established rule of practice, and its continued administration is especially during the existence of active inflammation to exclude mercury."—(Treves's Essay, part 1, p. 121.)

In rare instances of venery, in which the prepuce is not diseased, the patients were also advised with a natural phlyosis.—(Frost, On a Syphilis.) But his notion, the same thing is three times repeated, and as he maintains that phlyosis may be removed by cauterization of the penis, he shifts his ground always in the end.—(Faulkner de la Harpe, English, p. 306.)

TREATMENT OF PARAPHIMOSIS.

The removal of the stricture in this case should always be effected, because its continuance is apt to produce a mortification in the parts between the stricture and the glans. It may be done in two different ways by compressing with the finger at the head of the swollen corn, or at to render this part soft, and then to apply the constriction prepuce to be brought forwards over it with the aid of the two fingers, or by dividing the stricture with a lancet. In a former edition of this work, as Mr. Jones of Philadelphia has remarked, "the power of this operation, in producing the reduction of the prepuce, should have been mentioned. This method should always be put in practice before the reduction by compression is attempted, as a preliminary measure, which sometimes succeeds of itself, and renders unnecessary any violent handling of the parts. First, the prepuce is drawn forward over the head of the penis, behind the prepuce. There are several the first mode, I believe, phlyosis, the second one to be so frequently necessary as Mr. Hunter seems to say. This operation is not so troublesome as is supposed, because the stricture is easily of the entire corpus in close the right part, which change be put it without difficulty. Mr. Hunter says, the best way is to separate the two stricture as much as possible when you push it out, and so expose the constricted part; then take a small pointed bistoury, pass it under the constriction, and divide it. None of the swollen skin on each side should be cut. The prepuce may now be brought forward, where it is brought more extended, for the purpose of drawing the stricture, in which it is the power, phlyosis."—(See Hunter on the Venereal Disease, p. 336, 337.)

The original disease producing phlyosis and pre-

glycogen must always be situated in, and the arrangement of them must be necessary in consequence according to the nature of the affection of which these are the effects.

One of the most interesting studies in physiology and pathology is J. L. Petit, *Traité de Méd. Cas. 12*. *Cronica* also J. Hunter on the *Præternatural Diseases*. *Schæffer, Médecine Hypochondr.* L. J. Nov. 1800. *Diagnose, ou Séméiologie Médicale*, par J. B. Lenoir, 1802. There is also a valuable chapter on this subject in *Hunter's Observations on the Venæ*, p. 6.

PILULE—See Memorabilia.
PILULE ARGENTI NITRATÆ. R. Argenti nitrat. gr. iij. Aquæ distillat. pili. aquosæ. M. S. 1819, p. 10. In first pil. 21. The nature of the Pharmacopœia Composita suggests the trial of these pills in chronic hæmorrhæ and other cutaneous affections, and phlegmatic, as well as dyspepsia associated with constitutional poverty. Two or three may be given twice a day. Dr. Ferri gives the argentea tinctura alternately in cases of hæmorrhæ, but without any sensible effect.

PILULE COLONYSTIBIS CUM HYDRAIL. R. Hydriarg. colonystib. comp. 3j. Hydriarg. sublim. 3j. Saponis 3j. M. In first pil. 21. These pills operate as a purgative, and they are often prescribed in various chronic cases.

PILULE CUSCÆ. R. Cuscutæ seed 3j. Pulv. betæ, coarsely, 3j. Hydriarg. 3j. These are the best pills in the use of Guy's Hospital. They are occasionally given in catarrhs, cancerous, and venereal cases. The surface should be kept with small doses and increase them gradually till cure, and continue for some time to a greater number of these pills may be given in this manner every day.

PILULE CUSCÆ SULPHATIS. R. Cuscutæ seed 3j. Hydriarg. colonystib. comp. 3j. Saponis 3j. M. In first pil. 21. These pills may be given in a day for chronic—(Pharm. Chirurg.)

PILULE HYDRAEUTÆ. Of these I find only obscure hints, that the first dose is ten grains, per Mercurium, but when prescribed as an alterative, from three to five grains will suffice.

PILULE HYDRAEUTÆ OXYDI RUBRI. One grain of this preparation is each pill in the dose, which is commonly taken at bedtime. (See Mercury.)

PILULE HYDRAEUTÆ CUM CUSCÆ. R. Hydriarg. purificat. 3j. Cuscutæ seed 3j. Hydriarg. sublim. 3j. Saponis 3j. M. In first pil. 21. The best alterative is to be first reduced by nitrate with the gum resin, moistened with a little rose-water. The saturated spirit of turpentine is afterwards to be added, and, being the powdered leaves in sufficient quantity to make a suitable size for pills. These, said to slight variation in the proportion of the leaves, are the pills recommended by Ferri, who directs them in five pills, each of three grains, to be given every night and morning.

No doubt there are many cases to which this formula may be very suitable. For instance, the enlarged vesicular gland, and some forms of hæmorrhæ, &c. For such diseases, Dr. Simpson is the Ferri's formula. Dissolve equal parts of pil. hydræutæ and turpentine root. (Pharm. Chirurg.)

PILULE HYDRAEUTÆ RUBRÆ. R. Hydriarg. sublim. gr. xij. Cuscutæ seed 3j. Hydriarg. sublim. 3j. Saponis 3j. M. In first pil. 21. These are the yellow pills in some cases. Saponis give two or two of these pills, as alterative, in chronic cases. At Guy's Hospital they add three grains of the gum resin to each pill, increasing the dose of the resin.

PILULE HYDRAEUTÆ RUBRÆ CUM CUSCÆ. R. Hydriarg. sublim. gr. xij. Cuscutæ seed 3j. Hydriarg. sublim. 3j. Saponis 3j. M. In first pil. 21. One may be given three or four, in some cases, cancerous, scrofulous, and some venereal diseases, preceding several doses.

PILULE HYDRAEUTÆ RUBRÆ CUM ANTIMONIUM TARTARIZATO. R. Hydriarg. sublim. 3j. Antimon. tartarizato. 3j. Saponis 3j. M. In first pil. 21. These pills are given in a day for chronic—(Pharm. Chirurg.)

PILULE HYDRAEUTÆ RUBRÆ COMPOSITÆ. R. Hydriarg. sublim. 3j. Cuscutæ seed 3j. Hydriarg. sublim. 3j. Saponis 3j. M. In first pil. 21. These pills are given in a day for chronic—(Pharm. Chirurg.)

PILULE OPI. These need only be mentioned among such as are of criminal utility in surgery.

PILULE OPI COMPOSITÆ. R. Opi purificat. 3j. Saponis 3j. Hydriarg. sublim. 3j. M. In first pil. 21. Used for alleviating pain and keeping up a gentle perspiration; are particularly useful in procuring painfulunctions in cases of hæmorrhæ, chronic, &c. (See Phlegma Chir.)

PILULE QUININÆ. R. Quininæ sulphat. 3j. Hydriarg. sublim. 3j. Saponis 3j. M. In first pil. 21. These pills are given three or four in cases of hæmorrhæ, and in various of the venereal glands from which.

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PLANTARIS MUSCLE. This is the muscle of the foot, which is situated between the heel and the ball of the foot, and is the most powerful of the muscles of the foot. It is the most powerful of the muscles of the foot, and is the most powerful of the muscles of the foot.

POLYPUS. A tumor, generally of a pyramidal shape, most commonly met with in the nose, uterus, vagina, and anus, and arises from a cystic or tubular base. It is most commonly met with in the nose, uterus, vagina, and anus, and arises from a cystic or tubular base.

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passing to the throat, or upon being slightly touched, are apt to bleed; those which seem to be fixed, and are movable by the action of blowing the nose, or of driving the air through the affected nostril only (when the polypus is only on one side); those which are immovably fixed, and which, when pressed against with the corner of the eye and forehead, and which, if they shed any thing, shed blood; those which by adhesion occupy a very considerable space, and seem to consist of a thickening, or of an enlargement of all the membrane covering the nostril surface; those which sometimes shed an ichthyous, offensive, discoloured discharge; those pointed which lower part, within the nose, is pale, carious, easily and freely is pushed out, and that is severe height, which, not to be attempted at least by the forceps, may, indeed, by any other means; and this, for reasons obviously deducible from the nature and character of the polypus. On the membrane, the very large extent and quantity of adhesion, will render dissection impracticable, even if the disease could be comprehended within the forceps, which is very frequently the case; and on the other, the vigorous nature of the dissection may render all partial removal, all unsuccessive attacks to it, and, indeed, any degree of dissection, practically of the most disagreeable consequence.

But the polypus which is one of a watery, gelatinous, light-brown colour, or look like a vegetable just gone to be decay; which may solidify or even putrefy, but become so upon being pushed; which have appeared to be at one time larger, at another less, as the air had happened to be moist or dry; which seems to be disordered freely by the action of respiration through the nose, which the patient can make to disappear by stopping the nostril which is free, or even more free, and then driving the air through that which the polypus possesses; which when pushed, give no pain, except yield to such pressure, become flat thereby, and draw a clear lymph; and which whose lower and visible part is pale, can easily, and that to some height, be pushed, are fair and fit for extraction; the polypus, in various circumstances, frequently coming away entire, as if it were, yet it is removable without pain, hemorrhage, or hazard of any kind; the period of which consequence, Mr. Pott can with strict truth affirm, is never met with when the disease was at all fit for the operation.

Of the benign kind of polypus (1) for extrusion, there are (says Mr. Pott) two sorts, whose principal difference from each other consists in their different course or attachment. That which is most freely movable within the nostril upon forcible respiration; which has been found to be most liable to change in size at different times and seasons; which has insinuated the most in the same space of time; which seems most humid, and most freely yields lymph upon pressure; has its origin most commonly by a stalk or kind of peduncle, which is very small compared with the size of the polypus. The other, which, although plainly movable, is much less so than the one just mentioned, which has been less liable to alteration from air and seasons, and which (without rather) does its arriving at a very troublesome size, is most frequently distinguished by the membrane becoming red of the same epineura. These latter may be extracted with no kind of hazard, and with very little pain, and hemorrhage; but the finger repairs the final stage, and mostly come away entire; while the others often break, come away piecemeal, and stand in need of the repeated use of the forceps.

Mr. John Bell criticises the distinctions drawn by the preceding writer, and still adopted in the best schools of surgery: he says, that a polypus is a vascular and never malignant; new, and the natural growth of the tunic, and the membrane is continuous without the soft and bony coats of the nostril and jaws, most being every polypus to and terminate here in its life and final stage. Polypus, he adds, is indeed a dreadful disease; but it becomes so by a slow progression, and advances by gradations easily apprehended. Every polypus in its early stage is, according to this writer, a small vascular tumor, attended with a swelling and watering of the nose; exerting an itching, sneezing, discharging with the blood, but easily improved with the point of the finger. It is small of size, and not at all bleeding; it may also be easily extracted so as to clear for a time the passage for the

breath. Yet this little tumor, slight as it may appear, is the germ of a very fatal and troublesome disease, and this very character often the very cause of its being so long as to resist treatment. The very early and extruded (says Mr. J. Bell) the more easily does it bleed; and, whether internally connected, or altogether free, it soon increases. But when it does increase, it is not really changed in nature; it has not become so, as it would seem, it is then to be treated, as at first, but from its pressure against the bony coats and membrane of the nose, it does so, by its pressure, obstructs the breathing, and even produces hæmorrhage. The tumor, as observed, now is even more watery than the previous one in the early stage; the breathing is in the manner injured, by the pressure of the tumor against the mouth of the nostril; the roots are changed, and so increase and are entirely lost by the sound air being passing through the coats of the nose and face. The breathing is in some degree affected by the weight of the tumor depressed by distension. The watery discharge is now more and more profuse, and more and more offensive. From the more pressure, the bones become carious, and the sides of the face and nose are destroyed by the slow growth of the swelling. It is not long before the tumor begins to project from the nostril in such a manner, that the arch of the palate is lifted. The nasal becomes widened and thickened; the nose is turned towards the opposite side of the face, and the whole countenance seems distorted. The side of the nose swells and becomes red, the nostril is enlarged and fleshy, the face yellow, and the patient is in great distress. The patient is affected with headache, which seems to find its lower boundary, and with general vapour and dizziness. The bones are very absorbed, and the membrane thickened; a foul and fetid matter, blackened with blood, is discharged from the nostril, and exudes from the face. The blood vessels will grow weak, and suffer a perpetual hemorrhage from the patient; the teeth fall from the sockets, and, through the empty sockets, a foul and fetid matter issues from the nostril.

Now the disease verges to its conclusion. The patient has terrible night, and experiences a series of suffocation. The repeated loss of blood renders him so weak that he cannot get up for several days together; and when he does get up he is so weak, Mr. Bell remarks, pale as a corpse, his countenance, and his face like wax, yellow and tumid. He now suffers insupportable pain, while the water is continually discharging from his nostril, and a great swelling from his nose. In this state he survives a few weeks, during the last days of his illness lying in a state of insupportable pain, and dying lethargic. Mr. Bell then observes, that "if medical treatment could be applied to the fact of malignity, there is no to be found in it, except a more insupportable disease than this, but in addition, though it destroys the whole, the operation, or the craniotomy, is not pronounced successful; neither is polypus malignant, though it destroys the bone of the face, and penetrates even through the external bone to the brain. These consequences result directly from pressure."—(See Bell's Principles of Surgery, vol. 3, part 1, p. 90-92.)

In April, 1807, there was a boy in St. Bartholomew's Hospital, only twelve years old, who had a very large tumor, which was the largest and most dangerous of which the nose, which I ever had an opportunity of beholding. The numerous blood vessels had expanded to the lower part of the nose to an enormous size, and the tumor, the first part was extremely enlarged. The disease continued the eyes were extremely inflamed, and the face was very red. The tumor was affected with hemorrhage, brought on by the pressure of the tumor, the slight relaxation to the last of the tumor, the tumor was covered the mouth, and the patient could be introduced with a spoon, and a great deal of the state of the palate was ascertained. About midnight before death, the legs became paralytic, during the last week of the boy's existence, as the tumor of the head and face grew great. On examination of the head after death, a good deal of the tumor was found to be of a cartilaginous substance, and which was most remarkable, a portion of it, which was as large as an orange, contained a large number of vessels, which it had communicated the entire lobe of the left hemisphere of the brain. Yet, notwithstanding the

effect, the boy was not conscious, but insensible, till a few hours before his death. All the surrounding bones that both more or less absorbed, and the plate from which the expenditure of grey could not be determined.

Excision has divided the utility of the operation, urged by Post against attempting to remove the patient, and by de Saenger, that setting the integument aside of a polypus, its absorption, and the removal of the tumour, are dependent on its position, &c. &c. and on reason for making the division in such—then de Saenger, in *Wunderlich's* v. 3, Kap. 31. This declaration, however, is at least with reference to any operation, is quite repugnant to the advice delivered by all the most experienced surgeons at England, who, in cases of extremely malignant polypus, always resort to their interference to palliative means.

Mr. J. Bell defines the common method, this polyp may be caused by picking the nose, burning it too frequently, colds, and local injuries. He claims that a polypus is not in general a head, as they thought; but only based, it is at three or four instances. Both methods are usually effected. He states, that no finger can reach that part of the nostril, where the root of the growth is situated, as it is deep and high in the nostril, and into the throat, and near the opening of the Eustachian tube. The finger cannot be introduced further than the cartilaginous wing of the nose extends, and can hardly reach the inferior point of the lower apertures here. The anterior and posterior chambers of the nostril are separated from each other by a narrow slit, which the finger can never pass, and which is divided in consequence of the projection of the lower apertures into two openings, one above, the other below. Through these the head of the polypus projects. These movable parts of the nostril, however, are very distant from the root, which is at the highest and narrowest part of the nostril.—(See p. 183, 184.) Mr. J. Bell also says, that three or four polypi may also crowded together in one nostril, while many are fitted at forming in the other.

He dwells upon the difficulty and impracticability of tying the root of a polypus, and explains, that in all attempts to cut out underneath, the surgeon's eye should be so near a point, nearly under the socket of the eye, in the deepest and highest part of the nostril, and that instrument can only do good when introduced beyond the narrow slit, formed by the projection of the lower bone.—(P. 185.)

Thomas Mr. John Bell is probably right in his opinion, that polypi do not proceed from the several circumstances which have been above noticed, as they are, in most instances, diseases of an entirely local nature. Critically, in general, it is very difficult to describe what is the cause of a nasal polypus. Frequently, the patient is in other respects perfectly well, and after the removal of the tumour, no new obstacles to respiration. In this circumstance, it must originate from a local cause, though it is generally difficult to define what the nature of this is. Sometimes several related symptoms precede the polypus, and perhaps contribute to cause it. It is possible, they may only be an effect of the same cause which gives birth to the disease; but no doubt, they are sometimes the effect of the polypus itself. Sometimes, perhaps, a faulty state of the constitution early contributes to the disease. At several polypi frequently grow in both nostrils, and even in other situations, at the same time, are reproduced immediately after their removal, and the patient often has no troubling appearance.

There are four modes of withdrawing nasal polypi; viz. extracting them with forceps, tying them with a ligature, cutting them out, and destroying them with caustic.

Excision is the most common and proper method, it is performed with the ordinary polypus forceps, the blades of which have holes in them, and are internally curved round, in order that they may take hold of the tumour more firmly, and not easily slip off it. The front edge of each blade must not be too thin and sharp, just what its fellow it should push off a portion of the polypus. The blades must necessarily have a certain breadth; for, when they are too small, they cannot properly take hold of and withdraw the tumour. When the blades are rather long, the instrument may be more firmly closed, and more conveniently retained.

It is generally directed, if impracticable to take hold of the polypus with the forceps close to its root, and in-

stead, when this rule is observed, the whole of the polypus, together with its root, is externally extracted, and there is less chance to supplicate the nostril, which is actually very profuse when the polypus is broken at the thick middle portion of its body. It is also a more frequently easy of observation, especially when the polypus is not too large. With respect to external forceps of polypus forceps, it should be remembered, that they actually operate from between the upper and lower nasalized bones, on the side of the nostril, and the best plan is, first to externally to ascertain with a probe the precise situation of the pedicle, when the forceps, guided by the probe, that have been readily grasp. Sir J. Cooper has however thought, as a substitute of the growth of a polypus polypus from the superior nostril: a plan highly worthy of the practitioner's recollection. Looking therefore, the nostril is so large, and the nostril so completely occupied by it, that it is not only difficult to be taken hold of with forceps. The polypus should then be grasped as high as possible. The mass of the polypus, if it is too large, it is better to take hold of at its upper part; and, in some cases, break where it is grasped, a portion being left behind, and a portion being removed. This is, however, void of danger if the surgeon does not make use of encephalotome to separate the pedicle of blood, but immediately introduced, the forceps again grasp the pedicle, and extract it. The next method the method of dissolving the pedicle, is to extract what remains behind at its root. In this way a very polypus is frequently extracted, (perforated, without any particular loss of blood.

After the polypus has been propelled as far forward, into the nostril as it can be, by blowing strongly through the nose, and the place of its root left with a probe, its superior part is to be taken hold of with a small pair of scissors, through the slit in the left hand, and is to be drawn gradually and slowly out, so that it may be the appearance of the polypus forceps into the nostril. The next step is to proceed to the inferior part, the more the polypus is elongated, the more it is because, the greater is the space in the nostril to the back of the polypus forceps, and the higher can this instrument grasp the tumour. After the root of the polypus has been taken hold of with the polypus forceps, or if this cannot be done, when the tumour has been grasped with the larger forceps as far as possible, it is to be held slowly and gently, and at the same time pulled upwards till it breaks. When the body of the polypus, and not the root, is grasped, it is a very important matter, rather to retain the instrument than pull it, and thus, rather to withdraw the polypus off than to drag it out. The lower and most slender of the polypus forceps is behind, the upper part where the exterior or superior is behind, the lower is the danger of hemorrhage, and the more firmly down the lower back of the tumour part is set. When the extraction is done with violence and celerity, only a piece is usually brought away, and the true head of the tumour remains behind. Sir J. Cooper recommends holding polypi from their attachment with a slender jerk, as the most likely mode to bring away the whole of the root, and even a portion of the Schneiderian membrane and bone, so as to bridge a gap: a piece of adze, however, which he means to intend the case in which the pedicle is grasped by the forceps, as a single attempt to be if possible; then, when circumstances oblige the surgeon to take hold of any other place, a considerable portion of the ligament, the rule of slowly and gradually twisting off the polypus, instead of using a sudden jerk, at which I consider the most likely method of extracting the pedicle is a mistake.

As soon as the polypus has been properly drawn, the surgeon is to examine whether any part remains behind. When the polypus is very narrow on the place where it has been broken, and the patient can breathe through the nostril freely, there is reason to presume, that the polypus has given way at its root, and that some continues behind. The finger, if it can be introduced, procures the most certain information; or the probe, when the finger is unable to reach cannot be employed. When a piece of the root is left, it is best to reproduce the polypus again, under the guidance of the finger or probe, and then grasp and twist off the remnant of the disease.

Some persons have always followed the operation, and by many means it is repeated as often as necessary. But this week the case is common daily given

smaller than the uterus at the time of a prolapsus. The inverted prolapsus, in which this vessel is not quite so large, is, perhaps by the position, at the lower part of which it is quite venous. In this situation, the polypus may occasionally have a degeneration, resembling the growth of the womb, but easy of dissection from it. A probe can be passed deeply into the uterus, but not so into the other opening. The polypus increases an inverted pear; that is, it is widest below, and becomes gradually thinner upwards. The short species of the prolapsus is narrow below, and gradually increases in width upwards. The latter uterus may easily be pressed back, and in that case, the patient experiences relief. The polypus then the effect of being pressed back; and, during an attempt to do this, the patient is put in much inconvenience. A probe may be introduced by the side of the polypus deeply to the fundus uteri. When passed by the side of the falling uterus, it is very soon stopped at the upper part of the vagina, which is thickened with the reverse of this vessel.

A prolapsed prolapsus externally from the vagina may be much more easily distinguished from a perfect prolapsus, without incision. The uterus is not so much distended as the uterus, as it is not only the latter. A probe may be passed deeply into the vagina, along the side of the prolapsus; but not so by the side of the uterus, for reasons of convenience. The figure of the labour, and the state of the patient, as an effect being made to reduce the prolapsed part, and bring it into its natural state.

When the condition of a few examples, in which an inversion of the uterus is caused by the descent of a large prolapsus into the vagina, it happens only in women who have been severely laboured, and has generally been preceded by a very much delivery, or the use of too much violence in the extraction of the placenta. While the thickened uterus lies in the vagina, its shape is broad above, and narrow below; whereas the uterus is thin above, and broad below. Hence, in cases of very large prolapsus the vagina, as it is not so much distended, while it is extremely distended by the invagination, descent of the inverted uterus itself. Here, therefore, the effect of the part is attended with relief; while every effort to push back a prolapsus causes an separation of all the contents.

When the inverted uterus hangs out of the vagina, its figure, like that of the prolapsus, is like a pear, and broad downwards; and like the latter prolapsus has no aperture at its lower part. An attentive observer, however, will easily avoid a mistake. The inverted uterus contains a cloudy fluid in its interior, next to the cranium of the vagina. This fluid is nothing less than the uterus itself, though from the body of the uterus has descended. There is nothing of this kind to be felt in cases of prolapsus. By the side of a prolapsus the figure of a probe may be passed simply into the vagina; but not so by the side of the uterus. The inverted uterus is firm and hard in the neck; the upper part of the uterus, which is below, has a soft, fleshy feel. Useful light is also generally thrown on the case by the frequent occasional cause of prolapsus, with inversion. The symptoms of a complete inversion are a red, fleshy tumour, as large as a fist or a child's head, proceeding from the perineum, with violent pain, and pulse sometimes, often running symptoms, sometimes, and death. The patient feels lightheaded, and painful; the uterus however extremely full above the pelvis is wanting; the extension, though with difficulty, may be retained. On the other hand, a prolapsus is movable, hard, and woody; it may be returned into the vagina with considerable pain, but is immediately expelled again. On the inverted uterus the measure of the blood vessel and the contents, in place of its insertion, may be seen. (Mayer, in Quarterly Journal, of Foreign Med. vol. 4, p. 476.) However, as medical cases of the diagnosis is much more difficult, and the observation of a woman strictly false, that is always difficult, and perhaps sometimes impossible to distinguish a prolapsus and descent of the uterus from a prolapsus. (See *Notandum in Anger's Case*, with the History of the successful Extraction of that Organ, during the Chronic Stage of the Disease, p. 92, in the London Med. Soc. 1821; also, First Issue of the Presence of Sperm, vol. 2, p. 567.)

Dr. Professor Richard, however, Mayer has had several opportunities of seeing these symptoms in

cases, and he mentions the following circumstances, in addition to some others already specified, as forming the diagnosis between it and prolapsus. Prolapsus not infrequently occurs in women who are barren; however, in those who have borne children. The symptoms of prolapsus, corresponding with disorder of the uterus, and frequently with their suppression, increase constantly, and when the uterus is passing out of the vagina, are accompanied with pain like those of labour. On the contrary, the symptoms of inversion lose their origin from the time of delivery; menstruation, usually violent pains, and some of the lochia in quantity and duration; according to a very rapid labour, or to a rough and violent contraction of the placenta. In cases of prolapsus, a discharge of sanguine fluids, mixed with blood and membranous fragments, is always present, occasionally alternating with copious hemorrhages, while, in examples of inversion, there is, in fact, an arrest of the uterus; the hemorrhage is usually scanty or third week, is very copious for some days, and is succeeded by a serous thin discharge, as clear as spring water. A prolapsus is altogether movable; but the uterus, however it is movable may be loosened by the duration of the disease, the effect of subsequent applications, &c. it is always capable of separation when fully detached with the pull—(See *Mayer's Work*, and the *Quarterly Journal of Foreign Med.* vol. 4, p. 477.)

In cases of inverted prolapsus, situated either on the inside of the cervix, or at the margin of the os uteri, the uterus is, as it were, from its commencement, in the vagina, and the uterus, when large, produces all the symptoms attending prolapsus of the first kind, except frequent hemorrhages. These seldom occur, and when they do, are short, because the part of the prolapsus differs in its position in the os uteri. The discharge of mucus, however, is more profuse than when the prolapsus is attached to the fundus uteri. As the uterus descends out of the vagina, it occasions a prolapsus upon the fundus uteri, in addition to the other invagination. Cases sometimes occur, in which prolapsus of the uterus is detached by spontaneous, and a cure is then immediately produced. These are first and foremost to be obtained the double entangled by Mayer respecting the possibility of inversion. Indeed, the mode of cure by ligature can only be explained by the increasing supply of blood to them.

With regard to the treatment of inverted prolapsus, no attempt can be made to extricate them until the os uteri is sufficiently dilated to permit the application of a ligature or the pressure of nodules. In the mean time, the attention of knowledge are to be checked by stool regimens; the uterus posture; small doses of opium; several pills, particularly the opiate; and cold injections of vinegar. When these means fail, however, and the knowledge endangers life, the os uteri should be artificially dilated and the prolapsus immediately removed. Caustic and retention of urine may also sometimes require special attention, before the os uteri has become dilated enough for the extraction of the uterus. (Mayer.)

According to the latter experienced practitioners, the best period for attempting either to cure or cut away a prolapsus of the uterus is soon after the menopause after knowledge, the period being then late and the flow of blood is then diminished.

Experience proves that the prolapsus, when once it, ligatured, have not that propensity to be reproduced which those of the same kind have. Here, for obvious reasons, extraction is not the right practice.

For the enlargement of prolapsus of the uterus, all the methods mentioned for the reduction of nasal prolapsus have been proposed; but modern practitioners hardly ever employ more than two, viz. the ligature and caustic.

The ligature is generally the most proper means for extricating inverted prolapsus, and is so much more easy of application than to the nose. In cases of the prolapsus, there is always abundance of vessels for the introduction of the necessary instruments. The prolapsus of the uterus has consequently a thicker pedicle than that of the nose; hence its cure by the ligature is more tedious; and on account of the greater mass and more yielding nature of the parts, the evulsion of the uterus, after the ligature is applied, produces less inconvenience than in the case made of treatment of nasal prolapsus. The inconvenience which do arise in

very of removals, for instance, the situation of which may be relieved by the catheter, continuous by glysters &c. Ulcerate polypsi are also less venial than those of the same kind, since less pain and fever follow the application of a ligature to them. The first method, formed as soon as the polypsi separates, runs free west-east, and may easily be washed away by irrigation.

That the polypsi cannot be tied while it lies in the uterus, is easily comprehensible. But immediately it has descended into the vagina, the operation may be undertaken, and may be performed with the same kind of double cord as is employed in the rectum. However, here it is extremely requisite that the ligatures should be rather looser than that already described, and somewhat curved. But as the directions sometimes deviate, two additional convenient instruments have been invented.

The first is Leake's instrument. It consists of two silver canulas which are twisted in each a median, and so joined by a joint that they are shaped like a pair of forceps. After introducing a ligature through the first tube, so that its ends hang out of their lower apertures, the instrument is to be shut and pushed upwards into the vagina, over the polypsi, on whichever side seems most convenient. Then it is to be opened, and the polypsi is to be pushed through the two branches of the instrument, which is to be brought exactly opposite each side of the tumor. In doing this, the ligature becomes applied round the root of the polypsi, and forms a hook. The extremities of the ligature are then drawn as tightly as possible out of the lower apertures of the canulas, and tied first in a surgical knot, and then in a slip knot. The instrument is then shut, and the ligature extends the end of the polypsi. Afterward it is to be tightened daily until the tumor separates.

Another instrument described by Nares, *De Polypsi* (Chir. Lect. Rudier's Chir. Hall, v. 2, p. 623), is somewhat peculiar. It consists of two silver tubes, twisted together in length, and as thick as an ordinary catheter. Both extremities about as much as the ordinary; but as they are made of glass, the ends are very easily to be turned as directed according to circumstances. Through each of the canulas a strong filament is to be passed, so that its ends hang out of the lower apertures, while its middle portion lies across between the upper apertures of the canulas.

The tubes are to be kept inserted until they have been introduced into the vagina as far as the root of the polypsi. One is then to be held fast, while the other is to be carried round the tumor, or to the opposite side of the canula that remains stationary. Thus the ligature becomes applied round the root of the polypsi. After introducing the finger into the vagina, to ascertain that the ligature lies in the proper situation, the ends are to be drawn through a small double canula, which is only specified of an inch long, but so wide that it can be pushed over both the tubes a certain way with the finger and the upper end of the long canula, with the aid of a certain degree of well-directed pressure. Then a small double canula, through which the ends of the ligature have hitherto been passed, and the width of which is sufficient to be pushed over the lower ends of the long canula as to bring them. The ligature is then to be drawn tight in the ordinary way, and fastened to the rings. The management of this instrument is so easy as to need no longer explanation.

Inside the first instrument, fully described here, have been described and recommended for tying up of the uterus. An experiment was made by Denon, and another, which is quoted by Mayer, claims the attention of such persons as wish to be informed of them.

The ligature sometimes drops in some species of an inflammatory or epidemic kind. The former requires antiphlogistic treatment. Sometimes fever arises, and the polypsi becomes exceedingly painful; in this case resolution is necessary. Epidemic, sometimes require the catheter of opium. When this is sufficient, and the symptoms are severe, it may be proper to shorten the ligature a little. As the polypsi has almost always reached its greatest growth at the situation of the knot, the more it is gradually loosened, the less the risk of its dropping off. As the polypsi with the catheter, and in some the double with clamps, sometimes something takes place. And lastly, the

polypsi is supported by the uterus springing back when they prove ineffective, the patient soon is lightened.

During the explanation and separation of the polypsi, the frequent use of injections will be necessary for the sake of cleanliness, and, as soon as the tumor is removed, it should be treated with a mixture of vinegar.

Histrix, in connection with most patients, whose disposition of cutting instruments is usually to support the polypsi of the uterus, however, with the instrument described and mentioned, a dangerous knowledge. It contains the use of the knife, however, when the polypsi has a junction with the uterus, and cannot be removed by a ligature. In this instance, it is, the surgeon may either cut off the polypsi along its root in the vagina; or he may first draw it gradually downwards out of the situation, and then remove it, perhaps, the first object might be performed with a sharp hook, inserted at the side, and drawn so that it is used for forcing the tumor downwards, as with what seems better, a pair of long, curved, sharp-pointed scissors. The last object may be accomplished with an instrument resembling Denon's instrument, which is to be introduced into the vagina in the ordinary way. The polypsi is then to be drawn out, and very gradually drawn out of the vagina, until the point is just to be drawn with a knife. This is, indeed, not done without pain, and a forcible traction of the uterus; but it is less cruelly than the operation. (See *Reinhardt's* *Female Diseases*, *Instrumentum per le Ligature the Polypsi*.)

When a polypsi with a pedicle attached to the uterus, is suddenly falling downwards, a serious & sudden laceration of the uterus. In order to prevent, as speedily as possible, the great pain and danger of this case, the surgeon must be the root of the polypsi to be cut, as directly as he can, and gain the uterus by means of a needle, through the pedicle, behind the place, where it is thick, after the ends thereof have been drawn to some length. Then the pedicle is to be maintained before the ligature, and the uterus is to be immediately reduced.

Stybol and Mayer, of Berlin, only appear of the ligature in two cases: 1st, when an artery is to be put pulsating in the stalk of the polypsi, &c.; when the stalk of the tumor is so thick that it probably contains large vessels. In all other instances they give reason, on the ground of the difficulty of applying a ligature, and because, whilst applied, the symptoms are not so severe, and the assistance which they afford various. They operate with round pointed canulas, tapered into a Roman 8 such as the blades and handles, and from 2 to 30 French index in length. The division of the work of the tumor is to be effected not at once, but by repeated strokes of the instrument. In Mayer's work six cases are related in which polypsi of the uterus were thus removed; it is quoted by Reinhardt and Kessel.

Several instruments are commonly used in the vagina, some of which have a broad base, and some a thin pedicle. The last form the application of polypsi. Their extreme density is ascertained by the touch. By making pressure on the bladder and rectum, they remove several impediments to the introduction of the wire and force. They may be employed and by means of the double canula. Should the instrument be situated on the lower part of the vagina, this instrument must not be required. This ligature will be applied with the hand, and the tumor cut off when the contracted part.

A polypsi is the analogous tendency, *ligature* of the uterus, and when of large size, may be easily cut in it. When an indication to resort is created by the tumor, the ligature with the finger or a hook, the polypsi, if situated on such the upper part of the vagina, is drawn into the mouth, so that it becomes visible. But as it requires compression during its freedom in the mouth, the patient is very uncomfortable, as it is a painful operation. When it is allowed to drop out of the mouth, it cannot be brought into the mouth, and it is very difficult to insert. The efficacy of such a thing, in any species, may reach that of a catheter. In this case it is also valuable. In all impossible it is also lost of it with instruments. An operation can only be performed when the polypsi is situated at the upper part of the vagina. The

extent, after which the same substance was conveyed from testis to testis. This proved it to be a lobe of the prostate gland; he would not have been misled by the gland at the base near the bladder, but rendered a separate lobe by two divisions in its capsule. "It is not passed directly through the canal of the bladder, on which it lay, and opened immediately behind the verumontanum. By means of this pore, a thin layer of epithelium is formed in the prostate gland, which gives passage to the viscous secretion. "Previous to this investigation says Sir Everard, it was not known to me, that any distinct portion of the prostate gland was situated between the urethra, verumontanum, and the bladder."—(*The Diseases of the Prostate Gland*, p. 15, 2nd. Lond. 1841.) Now, misunderstanding this explanation, as to the correctness of which most English anatomists have rejoiced, it is worthy of notice, that Langenhoven, the present distinguished professor of Anatomy and Surgery at Göttingen, in a review of Sir Everard's account, declares that he has never in the natural state of the part, traced the middle lobe, as it is called, which he considers as a spurious inflection, rising up in the shape of a fold.—(*Ann. Med. N. S.* p. 260, 2nd. Bazaar, 1845.) This claim would seem extraordinary, if it were not possible to suppose, that it may proceed not from all the subjects at Göttingen differing from Langenhoven being dissatisfied to find Sir Everard there has named the middle lobe of the prostate gland, but from Langenhoven's not having traced in the healthy state of the gland, any portion which he thought deserving of that name. But, though differences of opinion may be entertained about the name, size, &c. position, even names about the thickness, which appears to have been long ago increased, though not perfectly described, by Morgagni.—(*Observations Anat. & Med.* 15.) The paper by Mr. C. Bell, illustrating how far our predecessors had a knowledge of this portion of the gland, seems to me one of his best productions, and it is therefore with pleasure that I refer to it.—(*Phil. Mag. Account of the Muscles of the Uterus, in Med. Com. Trans.* vol. 1, p. 171, &c.—However, while suffering particularly acknowledges, it is not because a fact was discovered, or perhaps only commonly noticed, that there may not be improved in revising the real lecture, or perfecting the description of it; and, as far as I can learn, none of the anatomical teachers in this city, previously to Sir Everard's paper, particularly referred, to the healthy original state of the prostate gland, to the structure which he has pointed out, by whatever name it is distinguished.

According to Sir Everard Hesse, this lobe, in the earlier periods of life, when the body of the gland is in its usual state, is small; but, as it appears to become enlarged, even when the body and the lateral lobes have been considerably increased in size; but, in subjects of advanced age, this part, as well as the rest of the gland, is usually found somewhat enlarged, even in cases where no disease has been suspected during life.—(P. 17.) When the middle lobe begins to enlarge, it presses too close towards the body of the bladder, putting the urethra backwards upon the neck, and communicating to it, by antero-lateral contact, the obliquity which occurred in its enlargement. Hence, such in making water, particularly after the last drops are voided, but a short and straining to discharge more, after the bladder is empty.

As this antero-lateral part of the neck arises, the disease in males seems to become frequent, and there is commonly more or less constitutional disturbance, or sympathetic fever. As proportion as the middle lobe increases in size, it presses more the cavity of the bladder is less free of a nipple; but after a further enlargement, it loses the nipple-like appearance, because broader, and forms a transverse fold by pushing forward and stretching the membrane, covering it to the lateral lobes. "As the transverse and transverse fold are situated immediately behind the neck of the urethra, they are pushed forwards before the urine is voided, and rising up the opening of the cavity of the bladder is very much diminished, when the anterior part of the bladder being pushed forward, and the transverse fold being raised, the opening of the membrane of the posterior part of the bladder being put on the stretch, the urine is spread, so that a certain quantity of water is allowed to trickle, but the bladder is not completely emptied."—(P. 24.) Sir Everard

Hesse afterwards explains, that, as the urethra enlarges, the quantity voided, at each time, becomes smaller, and what is retained is increased, until, at length, the disease becomes so much aggravated, that there is a complete retention of urine. The body of the gland, with the lateral lobes, though free diminished, but the middle lobe by the constantly repeated efforts to void the urine, becomes more or less enlarged; but if it is considered, that they do not preserve quite their natural or any regular position in the middle lobe, nor do they always divide equally together, the left is some instances becoming smaller than the right.—(P. 25.) When he published his first roll on diseases of the prostate gland, he had seen only the left lobe from the greatest projection within the bladder; but in his second roll, published in 1818, there is an engraving representing the right lobe also enlarged; and he mentions two instances, in which a similar enlargement of the same lobe had taken place. Mr. Wilson has also seen three cases not with this greater swelling of the right lobe.—(*On the Male Urinary and Genital Organs*, p. 336.) The recollection of these facts will often enable the practitioner to notice the bulk of a calculus in the direction by which it may be conducted into the bladder; and thus, as Mr. Everard Hesse has remarked, the surgeon, after trying gently on the left side, and not succeeding, is not to persevere in that direction, but try whether the passage will offer less resistance on the opposite side.

The diseased state of the body of the prostate gland, and of the lateral lobes, have attracted to by Sir Everard Hesse, he says, is very different from that which is met with in the earlier periods of life, in consequence of increases of the urethra, and which excludes when the inflammation in that canal is removed. This enlargement of the prostate gland from structure, he observes, may not be simply compared to the swelling of the testicle, is sometimes a case of accidental inflammation, is a healthy testicle; while the other disease of the prostate is analogous to the more permanent disease of the testis. This author observes, however, in a few instances, in which the enlargement of the body of the prostate gland from structure, in persons fifty years of age, did not exclude immediately the latter affection was cured, a common disease stopping at the neck of the bladder, although a calculus, which had a similar curve, usually passed. According to Sir Everard Hesse, in such cases, the patients were able to empty their bladder, it is evident, that there could be no enlargement of the middle lobe. In cases like these, no symptom of inflammation is produced, and neither the swelling of the prostate readily subsides, or, is of so consequence; though, if the urethra do not return, it will always ultimately remain.—(*On Diseases of the Prostate Gland*, vol. 1, p. 24.) In patients under fifty years of age, Sir Everard Hesse has rarely found the middle lobe so swollen as to produce retention of urine, or an inability to empty the bladder, notwithstanding the neck of the gland might be much enlarged.—(P. 25.) When the middle and one of the lateral lobes project considerably into the bladder together, their surface is sometimes excoriated, and thus an abscess appears. Under such circumstances, the pain, after voiding the last drops of urine, is said to be very severe, and attended with spasmodic affections of the neck of the bladder, of the most distressing kind.

According to Sir Everard Hesse, another effect of a similar enlargement of the prostate gland is, to render the secretion extremely scanty and very abundant. A question might arise about the real cause of this scanty, and some would infer that it was secreted by the bladder; but that it comes entirely from the increased prostate gland is proved, says this gentleman, by its having been found in one instance with one extremely flowing in the bladder in the dead body, while the other extremely appeared divided into small diameters, terminating in the thickness of the covering cloth of the gland at the verumontanum. The quantity of secretion is observed to depend more upon the degree of irritation, than the actual enlargement of the gland, and, as this increased secretion happens in cases of swelling of this part from structure, when the body and lateral lobes are also affected, it is inferred, that the disease of the middle lobe only contributes in that effect by keeping up a constant and disturbance of every part of the gland.—(P. 32.) The various conditions

of the bladder inflames, and becomes extremely irritable, so that, even when the quantity of urine is small, there is a great deal of straining. When the size and form of the bladder are such as to allow the greater part of the urine to pass, though with great effort, Sir Everard states, that the symptoms may continue awhile for some time; but, however, in common suppurations from slight causes, and becoming more or less relieved, when these are retained. Nay, he observes, that the symptoms may even lessen, although the disease is not at all dissipated, a circumstance which is ascribed to the increased folds of the bladder having acquired greater strength, and the internal cavities having lost, from lake, the elasticity which it possessed in the earlier stage. (P. 34.) The author explains, that, in this disease, when the inside of the bladder is inflamed, the numerous papillae of coagulating lymph are thrown off from its surface, when the inflammation subsides, outside in the same manner, looking not unlike white lymphoid, and when the inflammation is very violent, perfectly formed pus is met with in the urine. (P. 35.) After the inflammation subsides, the bladder becomes again capable of retaining a larger quantity of urine, though its power of completely emptying itself is still farther diminished.

According to Mr. Wilson, the cystitis which generally attends an enlarged prostate gland, is similar to that of an inflamed bladder—constant, heavy, dull pain in the gland, and sometimes sharp lancinating pains, falling down it is the urethra, and occasionally to the bladder and ureters. Prostatic catheterism is used, which is passed with difficulty, only a small quantity being discharged at a time, as more or less mucus remains behind in the bladder. A complete retention of urine may be produced, so that not one drop will pass, although with passing is used. Great difficulty is experienced in emptying the rectum, and after each evacuation, a feeling is still experienced, as if the gut were not yet emptied. During the efforts to empty the same and from a quantity of the viscous secretion of the prostate gland is not infrequently forced out. Most of these symptoms, as Mr. Wilson observes, are similar to those produced by stone, and, therefore, when they occur, the gland should be examined by the rectum, and if the rectum is diseased, a sound should be introduced into the bladder. (On the Male Urinary and Genital Organs, p. 339.) The particular difference between the symptoms of stone and those arising from disease of the prostate gland, are explained in the article *Enlargement*.

Mr. Wilson first pointed out a fact, which the general surgeon should never forget, viz. that the swelling of what is now called the middle lobe of the prostate gland, often raises the sound over a small stone in the bladder, and prevents it from being felt. (On the Female Urinary, p. 120.) Hunter also first noticed another circumstance well deserving consideration, viz. that no enlargement of the same part may occur in the disappearance of all the symptoms of stone in patients who have already suffered greatly from it, as the pressing pressure the catheter from falling down upon and irritating the neck of the bladder. These truths are exemplified by cases, which are highly interesting. It appears also probable, from the observations of Sir Everard Home, that an enlargement of the middle lobe is analogous to the dilatation and enlargement of callosity in the bladder, partly by preventing the excretion of urine from the ureters, and partly by hindering the bladder from regularly discharging its contents. (Vol. 1, p. 44.) Lastly, the explanation, that in disease of the prostate gland, patients require less urine than natural, and that death is sometimes produced by the retention of urine accompanying the urinary stoppage. In cases of enlargement of the middle lobe, the same symptoms in which Sir Everard Home says arise are, likewise produced by riding on horseback. (Vol. 2, p. 37.) Inflammation and even absorption of the membrane covering the middle lobe, he says, are more frequent than in any of the other parts, and are produced by the rough introduction of instruments. Hence, the burning heat at the neck of the bladder, the great pain and distress attending the passage and the maintenance of an instrument, the occasional necessity of taking it out, and the distance of the pain for some time afterward. (Vol. 1, p. 38.)

According to Mr. Wilson, in a case of what is called white or prostate gland, the enlargement of the same place therein, attended with pain, and is particularly attended to the prostate is apparent in the prostatic enlargement in this stage after death, but is very changeable, when the part is felt from the outside in the living patient. As the disease proceeds, the structure of the whole gland changes, and the part enlarges sometimes regularly, so as to prevent the urine, to the size of a moderate charge, sometimes very irregularly, depending on a lot of other causes. When the gland is in this state of enlargement, the substance becomes, in the face of a whitish brick colour, and the membrane which extends through it in various directions are often very strongly marked. In general, however, the ureters and bladder are opened, the gland appearing enlarged laterally. It also grows backward towards the rectum, producing that appearance of the enlargement particularly noticed by J. L. Petit, and already mentioned in speaking of chronic inflammation of the gland. Mr. Wilson further states, that the enlargement is generally less enlarged, because its position with the prostate prevents it from passing far forward. However, this part of the prostate is more enlarged, in which the enlargement, where it is in front of the ureters and is considerable. The extent of the lateral and posterior swelling may be readily felt with the finger, surrounded within the rectum. Thus three very singular enlargements in the prostate position of the ureters are the quantity occasioned by the disease, is accompanied by Mr. Wilson's experience, and numerous prophecies in the structure of the Urinary Organs. In the progress of the enlargement, the ureters do not always swell equally, one often enlarges more, and often enlarges more in one particular part than another. This produces a lateral bend, or obliquity in the passage, which will of course increase the difficulty in passing the stone, and of introducing the catheter. There are, therefore, irregularities of the internal swelling, depending from the gland being in connection to both sides. (On the Male Urinary and Genital Organs, p. 332.)

As every considerable enlargement of the prostate gland is attended with great difficulty in voiding the urine, the numerous folds of the bladder always become more or less thickened, so as to prevent the effect which it is obliged to make.

In relation to the third or middle lobe, it is to be observed, that from some diseases made by Mr. Wilson, it would appear, that in many cases the enlarged portion of the prostate projecting into the bladder, is in the third lobe, but a part of the gland remains more backward. (See Dr. Wilson's Surgical Obs. vol. 1, p. 33, 44.)

According to Sir Everard Home, a division may be distinguished from an enlargement of the prostate gland, by the following circumstances:—The degree of the obstruction from the external orifice is not determined by passing a soft bougie, which is to be felt in the canal for a minute, so as to produce an impression from the obstruction. If the bougie does not pass farther than says inches, and the end is marked by an swelling of a circular form of a tumour as to the size of the orifice, the disease is probably a stricture. But if it passes farther on, and the end is marked, the case in the prostate gland is to be accounted. This is general may be determined by the quantity of urine into the bladder a double pain catheter with a very very small curved, which is most casual dilatation of the gland may be ascertained.

On the subject of the nature of a serious enlargement of the prostate gland, it appears to me, that there is some uncertainty, excepting that it is a disease which can with under the age of fifty. Dumas supposes that it was sometimes venereal, and sometimes not. He says, who had repeatedly had gonorrhoea. (Traité des Mal. Chir. c. 3, p. 236.) I believe, from the sentiments is exemplified by the best reasons of the present day. According to Sir Everard Home, it is not uncommon for a man to arrive in early years of age, without suffering from any kind of disease of that part. "The more common theory says, he is a sufferer from the prostate gland, and he is not very kind, incoercible, indolence, to prove with women a peculiar state of the bladder, and of progress in the state of cold; indeed, whatever increases the circulation of the blood in those parts (the prostate), I suppose, beyond the healthy standard, only becomes a cause of inflammation in this gland, the blood-vessels of which are full

white membrane, says Scarpa, the severity of the preceding state. The adjacent pterygium may be cured in the same manner as a speck of the cornea, viz. by directly cutting off that portion of it which is situated in the junction of the cornea with the sclerotic, without detaching the whole of it from the surface of the former membrane; just as is practised in the opacity of the cornea, in order to destroy the communication of the vitreous body of the conjunctiva with their tracks, the pterygia which produce and maintain the disease.

That the pterygia are only the external, delicate, transparent expansion of the conjunctiva at the point, continued for a certain extent laterally, fixed upon one membrane, may be inferred (conjectures Scarpa) from the fact, which the pterygia and conjunctiva form at the same time, when the united parts turned towards the origin of the disease. The same inference is highly inferable from the fissure occurring in both membranes whenever the eye is moved in the opposite direction. We become still more convinced of the fact by observing, that in the first position of the eye, both the pterygia and the corresponding portion of the conjunctiva (which is equally relaxed, various, and reddish, may be easily taken hold of with a small pair of forceps and raised together in the form of a fold.

Mr. Guthrie does not agree with Scarpa, that chronic variously situated with relaxation and thickening of the conjunctiva, subjects of the cornea, and pterygia are diseases differing only in degree. On the contrary, he holds that a true pterygia is very rarely the consequence of chronic inflammation. The pterygia, he observes, is never of the spear-shaped shape of the pterygia, but always triangular, its progress either from the outside towards the cornea, and the width of the fold equal to that of the latter disease.—(*See Operative Surgery of the Eye*, vol. i. p. 185.)

The pterygia is observed by Mr. Travers to be less prevalent in warm climates.—(*Speeque*, &c. p. 181.) It is also said to be most frequent in old people, though Mr. Wanson and Mr. Mearns have each in a very young subject.—(*Waller's Manual of the Diseases of the Eye*, vol. i. p. 115.)

The contrary of the triangular figure of the pterygia, with its basis on the white of the eye, and its apex on the cornea, is one of its principal diagnostic characters, by which the true disease may be distinguished from every other soft, fungous, reddish excrescence obscuring the cornea.

Another distinguishing character of pterygia, as Scarpa has observed, is the facility with which the whole of it may be taken hold of with a pair of forceps, and raised into a fold on the cornea. Every other kind of excrescence attached to the membrane possesses little adhesion to it, and cannot be folded and raised from the surface of the cornea in any manner whatever. This peculiarity is of the highest importance in the treatment; for the genuine pterygia may be cured by simple means, while fungus excrescences of the cornea can only be radically removed and perfectly cured with the utmost difficulty.

Scarpa's belief in the reality of a malignant or cancerous pterygia must appear a debatable and disputable question, when it is considered that Mr. Travers makes no mention of the disease assuming that character, and Bowdler states, that in a practice of thirty-one years, he has cured 326 pterygia of various sizes and thickness, without one had symptoms of malignancy. And hence he justly concludes, that the disease is entirely local.—(*R. 2*, p. 641.)

The true benign pterygia, says Scarpa, which has a triangular figure, is ash-colored or pale red, is free from pain, and advances of being raised in the form of a fold on the surface of the cornea, may be cured by cutting the opaque triangular ligament separately from the membrane of the cornea, which is in part covered by it. But as the pterygia is nothing but a portion of the delicate transparent layer of the conjunctiva, converted into a thick opaque fold, it follows that the pterygia cannot be removed in any way without the eye which it encompasses the cornea being bereft of its natural natural covering, and this part of the membrane exposed more or less long.

Scarpa's apprehension whether it is true, however, that the stipulated fold-like spot remaining on the cornea after the removal of the pterygia is always

less sensitive than the space previously occupied by the disease.

It is in consequence, says Scarpa, to remove the pterygia by making the incision on the cornea, and extending it over the white of the eye as far as the base of the disease reaches on the conjunctiva; so that when the pterygia grows from the internal angle of the eye, must otherwise continue the same as far as the sclerotic. This practice is much to be preferred, because it divides too much of the white of the eye; usually, because, in consequence of the large portion of the conjunctiva removed at the base of the pterygia, and in consequence of the division of the vessel, the cicatrix in the white of the eye forms an elevated ligament, which, like a little cord, keeps the eyelid approximated in the corneal bed, and destroys the freedom of its motions, particularly towards the external angle.

In the treatment of pterygia with less extension in the white of the eye, Scarpa prefers drawing them at their apex, as far as the junction of the cornea with the sclerotic, and then to separate them at their base by a transverse incision, superimposing one line to breadth of the substance of the conjunctiva, and make in a direction commencing with the edge of the cornea. Scarpa has observed, that in this mode of operating, the subsequent cure takes place sooner than when the common method is adopted. The cicatrix requires no sort of dressing, and the conjunctiva, circularly stretched by the cicatrix, lies smoothly over the white of the eye, and loses that relaxation and various state which he considers as the groundwork of the pterygia. Such a cicatrix, however, is not requisite when the pterygia is small, and its base does not extend far in the white of the eye.

The operation, after drawing the patient to move the eyeball towards the part corresponding to the base of the pterygia, is to take hold of the membrane with a pair of forceps held in his left hand, and push it into a fold, at about one line from the apex. The operation is next to be raised and drawn upwards, with a view of the removal of the pterygia, which is first, which follows the detachment of the pterygia from the sclerotic cellular tissue, by which it is connected with the sclerotic cornea. Next, by means of a pair of scissors, the surgeon must direct this fold as closely as possible from the cornea, proceeding from the apex towards the base of the pterygia. The action being completed to where the cornea and sclerotic meet, the fold is to be again elevated still more, and with one stroke of the scissors the pterygia and the detached portion of the conjunctiva reaching to base are to be detached, as economically and closely to the cornea as possible. This second incision will have a semicircular shape, the bases of which ought to extend two lines beyond the raised part of the conjunctiva in following the curvature of the eyeball.

When the operation is finished, the surgeon must procure the hemorrhage by washing the part with warm water, and then cover the eye with dry lint, or fat moistened in the same manner, which, kept on with a bandage that does not undergo much pressure.

If no particular symptoms arise, such as pain, irritation of the eye, considerable inflammation of the eyelids, it is sufficient to wash the eye and inside of the eyelids three or four times a day with a warm lotion of molasses, and carefully keep these parts clean being exposed to the air without compressing them. If the symptoms just mentioned should occur, antiphlogistic treatment must be adopted.

On the fifth or sixth day, at latest, after the operation, all the surface from which the pterygia was cut appears pterygoid, and covered with a fluid like mucus. The edges of the wound, and the adjoining part of the conjunctiva, assume a reddish colour. A forward of the surface of the wound cicatrix must and must daily, and at length completely close.

All local stimulants are to be avoided, and it is not till the wound is healed that the eye is to be covered, containing a few drops of camellian oil of rose, should be used three or four times a day, for the purpose of obtaining the relaxation of the conjunctiva and the vessels.

In the early stage of pterygia, while the membrane is as thin as a cobweb, Scarpa considers it unnecessary to separate the cornea of its natural covering, and that it is enough to cut off a portion of it in

PUPIL. When the opening in the centre of the iris is proportionately large, and this organ seems less deprived of its power of action, the disease is technically named *myopia*, which is either *accommodative* or *spasmodic*. The first form of the complaint, as Weller observes, is exemplified in cases of aphthous, hydrophthalmia, pressure on the brain from various causes, wounds, anæsthesia, &c. The second often presents itself as a paralytic affection of the iris, a state frequently induced by the application of certain narcotics, the belladonna and hyoscyamus. General cases of myopia are also met with, as well as instances brought on by long exposure to darkness. A distension of the pupil may likewise be the consequence of an affection of the retina or the motor capsule of the eye. When the retina sometimes swells, the motor-ventures produced by myopia, are intolerable of light, complete blindness is the destiny, and in the end anastrophic strabismus, occasioned by the intrusion of an inordinate quantity of the rays of light selected within the eye. The kind of myopia, and the mode of treatment, must often depend entirely upon the primary affection, of which many cases of myopia are only symptomatic. Of course, the original disorder must always be cured, if possible. When myopia appears to arise from paralysis of the iris, bladders may be applied over the eyeballs, and the same remedies used which are usually employed in other local paralytic disorders. The admission of too much light into the eye may be moderated with shades and coloured spectacles.

The case which is the reverse of the preceding is a preternaturally contracted, more or less considerable state of the pupil, termed *nyctopia*. According to Weller, it is sometimes congenital. It is often met with as a symptom of other disorders, especially aphthous, inflammation of the dura mater, pterygia, constriction of the brain, &c. Persons whose business is to be looking at small distant objects, as watchmakers, often acquire a nyctopia from habit, and they cannot be cured of it, unless they avoid the causes which brought it on, keep themselves in darkish rooms, and use a green shade or shaded spectacles.—(See *Weller's Manual*, &c. Translated by Monro, vol. 2, p. 51.) It is noticed by Beer, that myopia, and a degree of myopia, is less obnoxious than most other constrictions of ocular dilatation: for though the iris is motionless, and the pupil considerably diminished, the opening is perfectly clear and black and not drawn out of its usual position, nor its periphery edge in the slightest degree angular. The patient, though he is continually complaining of weakness of sight, is able to distinguish (with some trouble indeed) even the smallest objects in the daytime, and at very light illuminations; but his sight is extremely worse in the evening, and in darkish places in the daytime: he, when both his eyes are affected, is in the dark nearly blind, and uses severely his way. Beer remarks, that almost every considerable internal ophthalmic or iris, however favourably the disorder may be cured, and the myopia restored, always leaves after it more or less constriction of the pupil, which affection, though not the less portion of constricting myopia can be perceived in the posterior chamber, is marked with a partial or complete immobility of the iris. Beer assumes, in that every complaint which he has noticed for the permanent removal of this complaint has failed, the dilatation of the pupil was produced before but temporary. And with respect to the most powerful narcotics, he states, that at two times they were used than useless, as they caused a still greater constriction of the pupil, which, however, after a few hours, resumed its former diameter. Hence, this experienced oculist is disposed to set down the myopia following internal ophthalmia as an incurable complaint.—(See *Labor von der Augenkr.* 1. 2. p. 231, &c.)

The next case demanding some notice in this work is a disease of the pupil (termed *nyctopia*). According to Beer's observations, there is only one exception, in which in the adult patient a disease of the pupil is not the consequence of ophthalmia, and the case here specified is termed a *collyria* of the pupil, or *nyctopia pupillæ*, the causes of which are said to be, either a very considerable loss of the vitreous humor from a wound of the eye, or else a dissection of rather diminished state of the extra humor, known under the

name of *spasmodic*.—(Lieber, &c. 5. 6. p. 126.) Every internal ophthalmia, extending to the retina and choroid, when in its highest degree, it is said to produce a complete closure of the pupil. However, the obliteration of this opening is not the only cause of blindness; for long before this state of the eye happens, the sight is destroyed by considerable and frequently irreparable injury of the retina and neighbouring structures, in which the inflammation is directly situated. An inordinate closure of the pupil, Beer says, is still more disposed to take place at the period when little power from its first into its second stage, and especially (this is said to be particularly apt to occur) when in this stage the membrane becomes.—(Ibid. vol. p. 126.) In cases of the latter description, vision is not always quite recovered, but only more or less diminished, the remaining light effecting in the posterior chamber having formed only a diffuse, unaccommodated view. However, at the second stage of the inflammation, such light should be converted into a dense anæsthesia, with opacity of the lens and its capsule, the eye then only remains more or less perfect, the faculty of just distinguishing the light. But when, in such a case, the patient is completely insensible of the difference between light and darkness, the blindness, as in the examples mentioned above, is not owing to the closure of the pupil, or to the manner, but to other morbid changes resulting from the same inflammation which caused the defect in the pupil itself, and the cause of being ascertained by peculiar applications to the eye. Passing over another disease of the pupil by the unobscured matter of hyaline, and by the continuance of effused blood in the chambers of the eye, I must to the rare case noticed by Beer, in which a closure of the pupil arises from a partial dilatation of its iris to the cornea (aphthous anteriorly and vitreously) happens, when a considerable portion of the iris, or a great part of the whole of its periphery edge protrudes through an opening in the cornea, and becomes adherent to it. However, sometimes, in these cases, the pupil becomes completely obliterated, though the protrusion of the iris is inconsiderable, and its periphery edge not engaged in the cornea; a circumstance exemplified when the cornea over the adherent part of the iris extends very much, and lets an extensive, iridescent surface, so that, though the pupil may be of considerable size, it is contracted, and vision impaired. And even when there is no adhesion of the iris to the cornea, no aphthous anterior, as it is termed, and no dissection of the pupil, a large dense vitreous of the cornea may obliterate vision by being exactly over that aperture. Lastly, as Beer has explained, the cornea part of the cornea may be in an opaque, spoiled condition, so that the healthy iris can be observed only at certain points behind the cornea, so much of the pupil itself being distinguishable; and such contraction of this opening may be either continued or not, with a partial adhesion of the iris to the cornea. In such cases, the patient can frequently perceive the light very well.—(Ibid. 2. p. 124, 125.)

When what has been stated it is manifest, says Beer, that in many cases of strabismus the symptoms seem to be highly unfavorable, and that no except to Beer's artificial pupil should ever be made, when the patient's blindness proceeds from other causes besides the superficial state of the iris. Such an operation, Beer observes, can only be proper when the blindness is entirely owing to the closed or contracted state of the pupil; when the different degrees of light can be plainly distinguished; when the case is uncomplicated with any disease of other important structures of the eye, capable of rendering the surgical procedure difficult or impracticable; when the eye has been for a long time perfectly free from inflammation; when the patient is healthy, without any tendency to scrophulous, syphilitic, or gonorrheal, and both his eyes are completely blind.—(Ibid. 2. p. 126.) Some questions may be suggested respecting this artificial dilatation of the pupil, which is undeniably subject, because the line between the degrees of health and disease, suitable for the success of the operation, is difficult to specify, and gonorrhea, and scrophulous are often vague expressions. Yet, as death can ensue, I think, about the propriety of Beer's advice, never to attempt the formation of an artificial pupil, when the patient enjoys vision with one of his eyes: for when the one open,

The success of the proposal, given by Cheselden himself in the *Philosophical Transactions*, 1708, is very incomplete, and according to Mr. Guthrie, he did not actually perform the operation on the person whose history he there relates, but only succeeded in it as an effect of a particular operation which he considered worthy of record: a circumstance which, from not being attended to, has been the source of considerable error. (*Operative Surgery of the Eye*, p. 203.) Moreover, when he was at Edinburgh, now Cheselden died as an artificial pupil; but the process, as described by Howard, differs from the above, inasmuch as the needle moved as far across the posterior chamber as two-thirds of the iris, when its edge was turned towards the iris, which was then cut, and as much of it divided, as was necessary for the instrument to penetrate, as well as an artificial pupil of an oblique form.

There, perhaps, Cheselden's method, as described by Howard, is too subject to the usual one possible, but not the smallest benefit followed: for after the withdrawal of the stylus, produced by the operation, the transverse section made by the iris by the edge of the needle remained. (*Med. et Chir. Trans.*, Vol. 5, 1745, p. 147.) A failure from the same cause. (*On Operations*, chap. 29.)

An accident occurred in Paris, in the art of attaching a membrane, viz. the insertion of the iris together with the cornea, in Doyen's account, and on it perpetually, and the disease remained permanent. This led him to propose a perpendicular incision as the best expedient for making an artificial pupil. His plan consisted in opening the fornix, as is practiced for the extraction of the cataract, and in dividing the iris perpendicularly with scissors, gave that part of the pupil which is next to the cornea; did he affirm, that he has very successfully made from making the incision to make the external side, on account of the too great elevation of the optical axis.

Although the practice of making an incision in the iris or cornea is severely disapproved of by Ross, who says: "that it admits of being practiced only in very few cases, and is rendered quite unnecessary by what he denounces the two other better plans (p. 2, c. 180), it is still considered by some, and of experience as having recommendations, and the latter therefore endeavored to improve it. However, it will only be in vain to make in this work a few of its modifications.

In 1802, Sir W. Adams accomplished the revival of Cheselden's method of forming an artificial pupil, with the difference of using for the purpose a particular sort of knife. "What a singular mode (says this author) I could not cut through the iris by a gentle force, and it required to apply a greater force, the iris separated from its attachment to the ciliary ligament, which rendered all further attempts to effect a cure hopeless. The same accident appears to have happened to Mr. Sharpe at the time of this operation. In the hopes of procuring an appropriate instrument, I wrote to Dr. Lister, at the interval of a few months; but though I described in different instances, making the purpose for which it was intended, still I could not procure the needle which cuts on one edge, and the open pointed knife of different sizes, described by Cheselden. At length it occurred to me that the current edge of the current dissecting scalpel was well adapted to cut with facility. I therefore, when in London a third time, got a small knife made, two-thirds of an inch in length, and nearly a line in width, with a straight back, sharp point, and a curved edge, which cuts back towards the handle for about three lines."

(*Adams's Treat. On the Eye*, p. 203, &c.) According to this writer, it is not cases where there is no strabismus here, and the cornea is free from opacity, the position of the iris should be made in the center, and should extend across at least two-thirds of the transverse diameter. In a later work, however, he states that experience has convinced him, that so extensive a division of the iris is unnecessary for the preservation of the position of the iris, and that a fullness of one-third of its diameter is sufficient. The eye being gently fixed, either with the finger of the assistant, who supports the upper eyelid, or with a common sort of speculum placed under the upper eyelid, the artificial pupil knife is to be introduced through the center of the eye, about a line behind the iris, with the cutting edge turned backwards. The point is then

to be brought forward through the iris, somewhat more than a line from an temporary ciliary attachment, and cautiously passed through the anterior chamber, until it has nearly reached the inner edge of that membrane (as is expressed in a later description), "as it is it has traversed more than two-thirds of the width of the iris," which it should be almost immediately out of the eye, gentle pressure being made with the curved part of the cutting edge of the instrument against the iris, in the line of its transverse diameter. If in the first attempt the iris should not be sufficiently cut, the point of the knife is to be again carried forward, and similarly withdrawn, until the incision is of a proper length. After the operation, the eye is to be covered with a plaster of simple opium, and the patient put into bed, with his head raised. (P. 203, 204.) When the closure of the pupil is attended with a success, the primary steps of the operation are the same; but Sir W. Adams takes care also to cut the ciliary iris pieces, some of which he brings forward into the anterior chamber, while others he leaves in the opening of the iris, where they at first serve as a good bandage, which by the first intention (p. 205), and are afterwards absorbed. For an account of his particular method for all the various complications of cases, the reader must consult his publications, where every successful example of the operation are recorded.

That Cheselden's method ought not to be entirely rejected, there can seem to be no doubt. Like all other modes of forming an artificial pupil, it certainly does not merit exclusive preference. In addition to the brevity of Sir W. Adams, we have that of Mr. Ware, to prove that Cheselden's operation frequently succeeds. When the pupil had become closed, after an unsuccessful extraction of the cataract, Mr. Ware in several instances made a new pupil agreeably to Cheselden's mode, with the most perfect success. "The mode of the instrument as soon as they were avoided, and left the pupil very nearly of its natural size. The shape was not quite round, but the sight was immediately restored, and it is to great a degree as to enable the patient, by the help of suitable convex glasses, to see distinctly both near and distant objects, neither pain nor inflammation being consequent to the operation."

Where there is a prolapse of the iris, through a breach of the fornix, involving more or less of the pupillary margin, Mr. Travers handles Cheselden's method the most applicable; viz. "the transverse division of the stretched fibres of the iris, and which if the section is made in front of the membrane, &c. soon before backwards, admits of an improvement. The edge of the section instantly recedes and forms an excellent pupil." However, he afterwards adds, "that a partial adhesion of the pupillary margin may be combined with a nearly lost. In this case, the removal of the free border of the pupil, drawn by means of forceps through an incision in the cornea, will be preferable, on account of preserving the transparency of the lens."—(*Journal of the Diseases of the Eye*, p. 342.)

In a modern work, Professor Maunier, of Geneva, has published a very successful case, in which an artificial pupil was formed and a cataract entirely extracted. "I operated (says he) on the right eye in the following manner. The patient being seated on a chair, and having the head inclined upon a cushion, I placed myself behind him, and, with the fine finger of the left hand, holding the upper eyelid, while an assistant depressed the lower, I made with the right hand a semicircular incision at the lower and external part of the cornea. This incision occupied a full third of the circumference of the cornea. On separating the eye, the iris was seen projecting a little from the wound in the cornea. I exposed it with the blunt point of my scissors. Introducing the two blades closed into the anterior chamber, and then opening them, I caught the pupillary body; in particular for this, leaving the blunt blade between that membrane and the cornea; then drawing the scissors, a perpendicular incision of the iris resulted, extending a little more than half the chord of an arc of two-thirds of the circumference of the iris towards the side of the temple. The first incision not having succeeded the formation of a pupil of the necessary size, I introduced the same two blades a second time a little obliquely, and immediately the pupil appeared of a satisfactory form

and out, but exhibiting the crystalline convexity again. The second stroke of the surgeon had divided the capsule; I therefore introduced the second needle, in order to endeavor to destroy what adhered of the crystalline to the shock and connected circumference of the old pupil. This attempt did not succeed. Lastly, I effected a passage of a portion of the opaque lens, by means of a slight pressure with a large scoop, stretched on the lower part of the globe of the eye. The crystalline, which was of a shaggy consistency, came out with the greatest ease, and though it was not entirely removed, yet a sufficient quantity was discharged to leave the artificial pupil of a most perfect black. Wherever pupa was on the sides of the incision, and on the exterior and lower part of the iris. (See *Med. Chir. Trans.*, vol. 7, p. 360, at top.) In this communication are also two other cases, in which Mausey operated with success, though they were complicated with cataracts and adhesions of the lens to the iris. In some remarks suggested by Scarpa to the preceding account, the latter expresses his opinion, that it is not necessary to be scrupulous whether the crystalline be partly or entirely opaque, whereas the capsule is opaque and adheres to the iris behind the edge of the lens and around pupil. "In this case only incision may be got out, namely, the removal of the opaque adherent capsule, and consequently of the crystalline, whether it be transparent or opaque." In the second place (says Scarpa), I think there is no reason to believe, that in similar cases, it is advisable to make an incision upon the iris, proportioned to the size of the body to be extracted, rather than to make it small, which shapes the operation to destroy the crystalline and the capsule, with the intention of extracting a part and of substituting the rest to the power of absorption. Thirdly, I would establish as a fundamental principle, in similar cases, that after the complete extraction of the crystalline, with its opaque capsule, by means of the least possible introduction of the instrument, the artificial pupil ought not to be too near the incision in the cornea, and consequently not too near the incision suggested by it." (P. 367.) Scarpa then recommends a particular method of operating in cases where there are cataracts: after having made, in the manner of Wenzel, a transverse incision in the iris and in the cornea, he would introduce Mausey's scoops, placed at both points, into the anterior chamber of the opaque lens, and make an incision in the iris, diverging from the cut made with the knife. The aperture thus made, Scarpa thinks, would be large enough for the easy passage of the opaque lens.

Among other late opinions professed by Scarpa, we find the following: that no instrument is so proper as the scoops for making an incision in the iris; and when the case is not complicated by cataract, a very small wound in the cornea is sufficient; also the situation of a triangular edge in the iris, by means of a double incision with the scissors, is the most easy and least painful of all the methods hitherto proposed for obtaining a permanent artificial pupil; and, lastly, that, shortly after the cornea, present no obstacle, because the artificial pupil may be made opposite the transparent part of that membrane. (See *Med. Chir. Trans.*, vol. 7, p. 331, 332.)

As I have already noticed, the contraction of the natural pupil is sometimes occasioned by the iris being stretched towards some point of the cornea towards which it is adhered. This state, as Scarpa observes, is most frequently accompanied with unequal opacity of the iris, arising from the adhesion, or depression of the iris, as well as with equality of the lens and its capsule. At other times, however, these beyond parts preserve their natural transparency, notwithstanding the contraction of the natural pupil. In the latter case, the pupil, though enlarged from its dilatation, is not so fully dilated, but merely very much contracted, and incapable of admitting the quantity of light necessary for vision, especially if the opposite part of the cornea be slightly convex. In such an example, Scarpa recommends making a small incision in the cornea to the most transparent part, even with Mausey's scoops drawn down, and connected with life before it is made to break the adhesion existing between the iris and the cornea. If this can be effected, the natural pupil generally recovers its former situation and size; but if the distance be very firm, Scarpa instructs us

of the blades within the contracted pupil, behind the posterior lamella of the iris, first the other blade has inserted the point of the corner with the sclerotic. The iris is then to be divided in one form of the letter Y, without at all tearing the capsule or lens, both of which are transparent. (See *Diagnosis of the Eye*, p. 264, at 2, transit, by Scarpa.) When, after extraction of the cataract, the pupil has been drawn down in this manner by adhesion to the lower part of the cornea, the upper two-thirds of which are transparent, Dr. Mausey, of Glasgow, has succeeded by drawing to form an artificial pupil, and removing vision, by making a small opening in the lower and outer part of the edge of the cornea, opposite to admitting Mausey's scoops, with which the contracted blade of the iris are to be cut down by a simple incision, these lines to length. The iris thus successively divides and leaves out paper of softening wire. (See *Wells's Manual*, vol. 2, p. 10.) In the cases above specified by Scarpa, Dr. Wm. Aitken, in view of performing cataract, endeavors to separate the iris from the cornea, and then to alter the position of the pupil by drawing it towards that part of the cornea, which has remained transparent. For this purpose he punctures the cornea above and below the base of the iris, separates the adhesion, and then makes the disengaged portion of the iris pass through the puncture and leaves it there, even upon the sclera, if necessary, forwarding it out as far as it is deemed necessary for its being securely fixed. This method is disapproved by Scarpa, because a small portion of the iris in the same eye, appears to have a very serious disease, and rather calculated to increase the opacity of the cornea, and diminish the contraction of the pupil, than a good effect.

According to Beer, in the removal of a portion of the iris, cataract is particularly indicated in all cases in which there is a small transparent area, as in many examples of syphilitic disease, considered as the natural pupil by a central opacity of the cornea. Beer advises, however, as an exception, the cataract, which the transparent portion of the cornea is so small that an opening can be made in it with the best success, enough to permit the iris to be taken out or with a small hook or forceps, and a piece of it cut out about the ciliary processes. (P. 3, p. 209.) The reason Beer gives does not appear to myself very strong, because may be asked, why not require more room by cutting a portion of the opaque part of the cornea? What means a better reason against cataract, etc. than its refers to the risk of a second piece of the cornea not being left transparent, opposite the new pupil, and the contraction of that membrane. (P. 2, p. 21.) Beer likewise states, that cataract may be performed in cases of atresia of the cornea, in the manner of extracting the cataract, when the pupil is small, that an oblique pupil, formed during the disease, inflammation in the posterior chamber, and the more the lower edge of the cornea, or is exposed with some of the remaining capsule of the iris. The last case may be derived from the singular nature and form of the greater part of the iris; the wound, from the very indistinct manner in which the pupil is made of the different degrees of light. (P. 3, p. 208.)

The creation of a space of the iris, says Beer, requires the preliminary formation of a hole in the cornea one line in length, with the corner of the eye, and as far as possible in the sclerotic, as told in common, the opaque cornea may derive with the removal of the operation. The second part of the operation, the extraction of a piece of the iris, must be done in three ways, according to circumstances. 1. The iris may be cut by any where adherent to the cornea, in which case, after an opening has been made in the iris, the cornea, the iris is pushed out, through the edge of the wound by the second instrument, and left in the posterior chamber, which, apparently, the cornea immediately avails himself of to form the pupil of the projecting piece of the iris with a very fine hook, and cut it off with Beer's scissors. The remainder of the iris is internally retained behind the cornea, and a well-formed pupil is immediately seen. 2. Only the part of the edge of the pupil was drawn out adherent to and drawn through the cornea, when it is needed to form the artificial pupil; a wire is introduced by a lateral incision of the eye. Some time, after opening the cornea, then says, the operation

is directly to introduce a small hook between the iris and cornea, as is best to insert either of these parts with the point, and be it then, with the instrument directed obliquely, to go behind the pupillary edge of the iris, and, while the eye is drawn out between the edges of the incision, the grasping force is to be cut off with Davy's scissors. This artificial pupil is then extended behind the transparent part of the cornea towards the edge of this membrane. 2. The pupillary edge of the iris may be adherent to the cornea entirely in the situation where the artificial pupil is to be formed. In this case, then, directs the eye to be taken hold of at its greater convex with the hook, or (if this should fear its way) only with a pair of fine-pointed forceps, with both fingers set between the edges of the wound, and the point of the cornea thus provided cut off somewhat within the edges of the wound, as directing the iris further out might fear it and have a prejudicial effect. In all these cases, says Best, the undivided lens and vitreous will not be injured if the patient keep tolerably steady, and the operator have already acquired facility in the extraction of the cataract. The operation being finished, the subsequent treatment is like that generally adopted after the extraction of the cataract.—(See Cataract.) When cataracts are so performed in a closure of the pupil, consequent to removal of the cataract, Best particularly recommends the forceps to be used, though he adds, that such operation is applicable only when the remaining capsule has not been spoiled by inflammation, and the quantity of humor in the posterior chamber is not so great as to reach above the lower part of the eye.

The only other species of cataracts which I deem it necessary to notice, is what was proposed, in the year 1811, by the late Mr. Gibson of Manchester. It is described as follows:—The first object of the operation is to incise the eyeball, as in the operation for cataract, supra cataract. A puncture is then to be made in the cornea, with a broad cornea-knife, within a line of the limbus, to the extent of about three lines. As pressure is now to be removed from the eyeball, and the cornea-knife partly withdrawn. The consequence of this is, that a portion of the aqueous humor escapes, and the vitreous body comes in contact with the opening from whence it came, and closes it like a valve. A slight pressure may now be made upon the superior and nasal part of the eyeball, with the first and middle finger of the left hand, till at length, by an occasional increase of pressure, or by varying its direction, the iris gradually protrudes, so as to present a bag of the size of a large pea's head. This protruded portion must be cut off with a pair of fine curved scissors, and all pressure at the same time removed: the iris will then recede within the eye, and the portion which has been removed will leave an artificial pupil more or less circular.—(Gibson on Artificial Pupil, &c. Lond. 1811.) Such was this surgeon's mode of operating, when the convex of the pupil was attended with central opacity of the cornea, unobscured with adhesions. The effect of a slight adhesion of the lower border of the iris to the cornea will be, to prevent the protrusion of the first of these membranes through the aperture in the cornea, which protrudes as much facilitates the operation. In this case, a portion which does not adhere must be drawn out with a small hook, and then removed. Sometimes the adhesion may be separated at the time of making the puncture, and then the iris will protrude. When the whole or greater part of the lower border of the iris is involved in adhesions to the cornea, there must be separated with the cornea-knife when making the puncture, and the iris may thereafter be drawn out with the hook, in a degree of it be removed by means of very minute scissors. In every case, however, the removal of a portion is essential to success.

When a cataract is known to exist, Mr. Gibson recommends it to be depressed, or broken to pieces with the knife, before making the artificial pupil; and when the whole cornea is transparent, he directs a flap to be made in the centre of the iris with the cornea-knife, and then cut off with the long scissors.—(Gibson, op. cit.)

Coronoiditis, or the mode of forming an artificial pupil by drawing a portion of the iris from the ciliary ligament, is said to have been devised by A. Schmidt and Scarpa about the same time, and has been suc-

cessfully modified by Bismuth, Linsenbock, Hing, Graefe, and others.—(Waller on Diseases of the Eye, vol. 2, p. 85.) According to Bismuth, this mode of operating is indicated, first, only when the remaining ligament, effused in the posterior chamber after the extraction of the cataract, or reticulation (see this word), reaches five or six above the lower arch of the iris towards the ciliary processes; a circumstance which may be known by the considerable change of colour in the greater circle of the iris, and by the indistinct manner in which the pupil perceives the light. Secondly, when the iris is every where adherent to a remaining capsular connective, or capsular lenticular cataract, or the closure of the pupil has been occasioned by a patient or bloody contact. Whenever the attempt is made in these last cases, however, the patient should be capable, as far as possible, of plainly observing the light. Lastly, coronoiditis is indicated by Best, when the bottom is every where intimately opaque, excepting of small part of it, if this it could not well be used for the exposure of a portion of the iris.—(Id. p. 102.)

When the closed pupil is the result of inflammation from an injury, the lens has been absorbed, and the vitreous capsule, or both the anterior and posterior, are thickened and firmly adhered to the iris with only an indistinct perception of light, and a discoloration of the lower circle of the iris, indicating a deposition of lymph behind it, Mr. Graefe was doing coronoiditis as the proper operation. After the formation of a triangular opening by the scissors should not be easily accomplished as a sufficient remedy; and the simple extraction of the central part of the iris would be general be sufficient, in consequence of the thickened capsule preventing the necessary contraction of the fibres of the iris.—(Operative Surgery of the Eye, p. 466.)

The first motion of the iris towards the ciliary ligament, and consequently the greater facility of detaching the edge from this ligament, with which it is connected, that of liberating the body, which Scarpa to try a few moments of stirring an artificial pupil when the natural one had become too much contracted, or quite obliterated, after the extraction or depression of the cataract. His method of operating consists in depressing by means of a searching needle, a corner extent of the circumference of the iris from the ciliary ligament, without dividing the corner. The attempt must with success.

The patient being reclined and supported, so if he were about to have the operation for the cataract performed, a straight slender searching needle is to be introduced through the sclerotic, at the external angle of the eye, about two lines from the margin of this membrane with the cornea; and the point is to be pushed as far as the upper and inner edge of the iris: in other words, as far as that side of the iris which is nearest the nose. The needle advances nearly to the ciliary ligament, and the surgeon perforates the internal edge of the iris at its upper part, so that the point of the instrument entirely appears in the anterior chamber, because that part of it is very narrow, the point of the instrument, however little it advances beyond the iris, would enter the substance of the cornea. The narrow needle appears in the anterior chamber, the instrument may be pressed on the iris from above downwards, and from the internal towards the external angle, so as to bring it in a parallel line to the anterior surface of the iris, for the purpose of detaching a portion of the edge of this membrane from the ciliary ligament. This operation being effected, the operator must depress the point of the needle, in order to apply it to the inferior angle of the iris that he has begun to separate. Then the aperture may be enlarged at pleasure by pushing the iris towards the temple, and withdrawing the needle from before backwards, parallel to the internal surface of the iris and the greatest part of the eye. If, when this detachment has been accomplished, no opaque body appears at the bottom of the eye, the needle is to be withdrawn altogether. In any portion of opaque capsule left behind after the depression or extraction of the cataract should attending adhesions and prevent itself in the vicinity of the pupil, the little opaque membrane must be ordered to be drawn, and pushed through the artificial opening into the anterior chamber, where, Scarpa says, they will be found and absorbed.

This separation of the iris from the ciliary ligament necessarily occasions an extravasation of blood, which

See also: *Argento*, 1, 2, Wien, 1917. *P. Specialist*, *Norfolk* and *Pagella* originally in *Milano*, 1911. The author practices the *delimitation* of the *city* from the *city* *house* with a particular view of *ferro*. He *most* *time* *in* *early* *time* *to* the *invention*, as he *begin* the *nothing* in 1385. *John* *Clapnet*, *Norfolk*, as he *Almshouse* *Pagella*, *Paris*, 1915. *Milano* *and* *Clapnet* *Organization* *of* *Paris*, *Paris*, 1912. *Specialist*, *by* *Pagella* *delimitation* *Conference*, *Lips*, 1913. *by* *Milano* *Paris*, *City*, *in* *France* *Norfolk* *House* *of* *Quercus* *in* *Clapnet*, *and* *of* *forming* *an* *Original* *Paris*, *Paris*, 1911. *H. P. D. Evans*, *Paris*, *City*, *in* *Clapnet* *and* *Clapnet*, *Paris*, *Paris*, 1913. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst* *Clapnet* *Pagella*, *Clapnet*, *Paris*, 1911. *G. Wagner*, *Committee* *of* *Clapnet*, *in* *Clapnet*, *Paris*, 1911. *Cl. Japhan*, *Das* *Clapnet*, *in* *Clapnet* *in* *Kunst*

valla Materie degli Occhi, etc. In Napoli, 1828.
Lengnitzer, Neue Hist. für die Chir. v. 1 u. 2, 1796.
Goss 1857-1859. Rouvier, *Derrière*, etc. Paris.
Berkeley, etc. *Attila* Kienrich, *Papier*, etc. Berlin.
1856. Aug. 1856. *Abhandlung*, *Ueber den gegenwärtigen Zustand der Künste*, *Papier*, etc.
in Deutschland, etc. Mainz, 1856. *Derrière*,
Kienrich valla *Papier* (historically). Milano, 1829.
This work suggests the method of opening the sclerotic,
under certain circumstances, for the purpose of ex-
posing the iris from behind forward. H. F. Guthrie
on the Operations for the Formation of an Artificial
Pupil, etc. Lond. 1819; or *Operative Surgery of the*
Eye, etc. Lond. 1823, speaks concerning it very largely
in respect of the subject, and many valuable observa-
tions. H. F. Guthrie, *Specimens of the Diseases of the*
Eye, p. 234, 2e. Ed. Lond. 1825. C. H. Wether, *A*
Manual of the Diseases of the Human Eye, trans-
lated by Dr. Berkeley, vol. 2, p. 25, 2e. Ed. Glasgow
1827.

FUD. (First rule, matter.) The Bond caused by the process of exhalation.—(See Inspiration.)

Q

QUININE, SULPHATE OF. This valuable preparation of bark, which is now beginning to be prescribed in a large number of malarial cases where fever is ague-like and general debility the poorest, may be exhibited in doses of from half a grain, three or four times a day, according to circumstances. As its utility is made to increase by an exposure of cold, one drop of sulphuric acid is frequently added for every grain of quinine. When, however, the circumstances of the case

render it advisable to dispense with the acid, the sal-
place of quinine may be prescribed instead if in any
aromatic water, like the *agua carra*, or in the form of
pills, either by itself or combined with opium, like pill,
quinine, the aromatic cone, or such other medicines as
circumstances may require. It may also be given to
children, mixed with syrup. Other preparations are
the wine and tincture.

R

RACHITIS. From *ráxu*, the spine of the back. Because the disease was once supposed to depend on disease of the spinal marrow. The jacks. See this word.

MANULA. (Dist. of yoma, a frog.) A toadster under the tongue, making from an accumulation of saliva and mucus in the ducts of the sublingual gland. The term has been derived either from an imaginary resemblance of the swelling to a frog, or from the disease making the patient, as it were, croak when he attempts to articulate. Many writers as have treated of this disease, before it was known that the tumor affected is more destined for the secretion of the saliva, could have no accurate notion of its true nature. Others it supposed to have issued to the muscle, in the fork between the seventh tooth, where, after tearing of the diamus of the tongue, he introduced the following passage, and lived *perpetuo interius adque* *sancti, quod per os eunt in tunc, delinquit iniquiter* *monet.* The latter assumption, however, is not probable, that some other affection was signified, as a tumor merely attended with a *series of events*, that is, pain. Fabricius at Squamensis and Dionis considered it exactly as an *inverted* tumor of the tonsil-like kind. Mead, better acquainted with the modern discoveries of anatomy, does not mistake the nature of the present disease; and he expressly says, that the affection originates from a thick saliva, which, not being able to pass out of the salivary ducts, accumulates under the tongue, so as to cause a swelling in that situation. Far from adopting the opinion of Mead, however, he took to that of Fabricius, and borrowed every thing from that author. Linnæ, de in Pains, in his notes on Dionis, adopted Mead's sentiments, he says, "There are two sorts of *Manula*, some, which are bound, and raised beneath the tongue, seem only to be produced by a distention of the secretory duct of the sublingual gland; the others are looser than they are round, are situated at the side of the tongue, and are formed by a distention of the excretory duct of the la-

Grass maturing grass. The field which this year is
mowed is the same, which gradually accumulates in
them, is a consequence of its vocation and the way of
the day.

Persons who serve their masters a great deal, and those who say, have been set down as very pliant to the present capitalist. But this opinion, I believe, rests on no good foundation. The flaw in the argument is precisely the whole of it; but it thickens after having remained a long while in the mind, and it is consequently a calumnious, and even slandering, insinuation. Karla does not proceed from an insubordination of the mind, as De la Paro supposed, but from an obstruction on the part of others of this mind. The capitalist often produces a thimble of very large size; but the working generally insists when it has attained the dimensions of a walnut, and then leaves us alone which cannot be denied. While the real cause of the disaster remains unknown.

Mr. E. Ball saw as also of this kind, which was made with the slogan that the survival instincts of the organism and economic applications were employed, and even a memorial column that all in vain. At length the true cause of the disease having been ascertained, a cure was accomplished in a few days by removing a piece of calcareous matter, which, by obstructing the ducts, had first caused the swelling and then ulceration.

The opening, when made with a laser, and not of sufficient size, frequently closes again. In this case, the prevailing response was days afterward. The aneurysm made the same twinkle - and hence, Park performed the actual surgery to the laser. Blood had also been under control, after they had been simply opened with a laser, and he was confident, for the avoidance of this inconvenience, the implications of a mixture of lakes of iron and sulphur, as well as the nature of the eye, so as to destroy it. As Louis remarks, all artists seem to agree that the sensation of the landscape should be the one he has been able

a strumous pustule after the eruption of a chancre; but he continued long after every remaining abscess.—(*Ann. Med. et Chirurg. Lond.* t. 60, p. 234.) The commentators, Mr. Guallard, illuminated himself several years with the discharge from strumous sores and abscesses, and the result was, that the disease could not be thus transmitted.—(*the Principles of the Practice and Theory of the Venereal System*, p. 121.)

The parts which are most frequently affected by scrofula, next to the lymphatic glands, and perhaps the skin, are the osseous fields of the bones and the joints. The first article the strumous disease is the latter parts is particularly discussed in the article *Joint*. The disease of the spine attended with a parasitic affection of the lower extremities, is, in itself, very frequently of scrofulous origin.—(*see Testicles*.) *Spina* holds a prominent place, and is especially seen in children, whose parents are strumous.—(*Thomson's Lectures*, p. 135.) The strumous which arises in the cellular substance, between the peritoneum and pleura, is often regarded as a strumous disease, and when the contents of the abscess are found to consist of a watery matter, somewhat resembling white of egg, a scrofulous peritonitis or pleuritis is diagnosed; but we can doubt that the complaint is concerned with this constitutional affection.—(*see Abscess of Pleura*.) The disease which arises in the thyroid gland is sometimes considered as scrofulous; but, though patients with this affection, very often live, at the same time, other constitutions, which are manifestly strumous, though the enlargement of the thyroid gland most frequently commences in an early period of life, like scrofulous disease, and though the tumor is sometimes limited by the capsule of the gland, and is sometimes, and indeed, the commonest, is either in the cellular—(*see Testicles*.) Scrofula also frequently makes its appearance in the form of enlarged appendages, in various parts of the body; the contents of such abscesses being a kind like matter, and the skin covering them being so indurated and appressed, and a thickened double fold. The strumous glands are often found universally diseased and enlarged in scrofulous subjects, and, as all discharges had to pass through these parts, before it can arrive in the circulation, we cannot be surprised, at the many ill effects which must be produced on the system, whenever glands are thus diseased. However, as I have already hinted, I have not established, by Dr. Rossignol, whether enlarged testicular glands are decidedly scrofulous; but if he is correct in his assertion, I fear he has been led to adopt it by his particular theory, which limits the origin of scrofula to the superficial absorbent glands. Scrofula frequently takes its attack on the testicles.—(*see Testicles, Diseases of*.) The female breast is also subject to scrofulous tumours and abscesses.

According to Mr. A. Cooper, scrofulous persons frequently have fistulas in different parts of the body, incrustated with inspissated matter. He agrees with most other writers in considering the absorbent glands and joints as the parts most frequently attacked, especially the glands of the neck and axillary. Various other parts of the body are enumerated as liable to it—the lungs, the brain, the eyes; but the heart, he believes, is never affected. The sweating glands, he also says, are rarely the seat of scrofula, as does the liver and kidneys; for the breast and testicles are exceptions.

Dr. Thomson believes, that some or less local inflammation occurs in every form and stage of scrofulous disease. He observes, that the swellings are very often the first thing attended with a sensible increase of heat and redness, and then the pain, though seldom acute, is always present in a greater or less degree. Pressure on scrofulous swellings never fails to excite pain; and the temperature of the skin covering them, is nearly even in these degrees higher than that of the contiguous parts.—(*Lectures*, &c. p. 111.)

Scrofulous inflammation, as Mr. John Harris observes is marked by a red swelling of the affected part, which very frequently is one of the lymphatic glands. The covering of the gland becomes greatly thickened, and its substance more porous and spongy. The swelling increases, and the discharge, first changes by degrees into that of pus, or inflammation, and is then characterized, by a thick margin, and is not usual till late in the disease. The skin is slightly red. At this time, an abscess or pimple is made, either on matter or very little contained;

the top of the wound opens, and opens, displaying a bloody-looking substance within; and between this and the skin a probe can often be introduced for some way at least. It, however, the disease should have advanced farther, this, there is very little elasticity in the tissue; it is white, not, rather blood, and decolorizes slowly; the skin becomes of a light purple colour, and small veins may be seen ramifying on its surface. Some time after these appearances, the skin becomes thicker in one particular part, and here it is also generally reddened of a darker colour. It afterward bursts, and discharges its fluid, like pus, mixed with a curdy matter, or thick white fluxion. The colour of the skin still continues; but the absorbent relations of the cancer subsiding, and thus a scrofulous stage is pursued. The margins of this kind of sore are generally smooth, obtuse, and overlap the skin; they are of a purple colour, and rather hard and raised. The surface of the sore is of a light color; the granulations are thick and indurated, and the matter is of a peculiar kind, which, says Mr. Harris, cannot be described. The discharge is thin, slightlyropy, and copious, with curdy flakes. The pain is insupportable. When the skin has continued for some time, it either begins slowly to exfoliate, or, as more frequently happens, the discharge diminishes and becomes thicker. An elevated edge is next formed, of a dirty white or redish color. This continues on the part a solid wall, and when it falls off, leaves the place covered with a small purple crust. Mr. Harris adds, that the preceding description corresponds to the old scrofula, or the strumous mamma of the old writers. Sometimes, especially if a large tumour below the axilla, the sore has a more bony appearance, the surface is dark-colored, the edges are soft, elevated, and inflamed, and sometimes spitted. The discharge is watery, the pain very considerable, and the surrounding skin is inflamed. This has been called the strumous melanosis. Such suppurating scrofulous parts are most frequently met with near the axilla; parts, particularly those of the nose. Sometimes a scrofulous chancre arises in the breast, first in matter, the breast of which abscesses, and assumes the specific scrofulous appearance, with the neck of the same still continuing to emit its discharge. Scrofulous swellings are often disposed to subside in winter, and recur on the approach of summer; but this is not an invariable law. Glandular enlargements are very apt to become smaller, in a short time, in some places, while others grow more extensive with equal indolence, notwithstanding the vicinity of the former ones. Ulcers also very often heal upon the appearance of the disease in other parts.—(*Baron's Dissertation on Inflammation*, vol. 2, 1802.)

The glandular swellings which occur in scrofula, says Dr. Thomson, are of a more acute character than those which proceed from scrofula. They arise from the absorption of a specific poison; and they do not, like those of scrofula, admit of a spontaneous cure; a better, however, may however not to be exactly correct.—(*see External Diseases*.) Glandular enlargements of the lymphatic absorbent glands occur also in cancerous; but these manifest little or no disposition to suppuration; they survive most frequently to considerable induration, or ulcers existing in the neighborhood of the glands affected; and they are accompanied in their progress and growth by a peculiar fluctuating pain.—(*the Inflammation*, p. 125.)

With regard to the particular cause of scrofula, several men may be said to discuss, even at the present day, in entire ignorance of it. After the education theory, besides scrofula to certain humors in the constitution, or diseased stages in the blood, had been exploded, the opinion gradually arose, that it was a disease of the lymphatic system; and indeed, that the discharging glands are often entirely the seat of its attack, when no changes are distinguishable in other parts; it is a fact that admits of no dispute. Besides, at the same time, that wherever discharges scrofula are extensively issued to the lymphatic system, must have a very imperfect conception of what is really the case. On the contrary, I fully participate in the sentiments of Professor Thomson, already adduced upon this point, but in the belief of modern medical writers, that strumous inflammations "are not to be considered as dependent on disease of any particular system, as the lymphatic."—(*Lectures*, p. 101.) But

written as have fitted upon the slightest vessels as the particular seat of scrofula, can throw no useful light upon its origin, by following up the theory, whether they imagine the cause to be disturbance of the vessels and glands, or take to the wild speculation of Calani, that in scrofula the vessels of the lymphatics are in a state of increased activity, while the vessels themselves are in a state of atony; or the doctrine of Bouchardet, that scrofula depends upon a passive plethora and debility of the vessels; or the hypothesis of Girtanner, that these vessels are in a state of increased irritability. The idea of disturbance being the cause has of late years been much on the decline; and that the involvement of lymphatic vessels forming the glands the acute perfora, and may readily be rejected, even when deemed, is a fact first demonstrated by Serres, which again would heavily against this opinion. Sir A. Cooper describes the disease as proceeding from congested activity, which attacks the whole course, and imparts to it a peculiar character, rendering the various processes of inflammation in it slow and imperfect.—(Lancet, vol. 3, p. 65.) Of the exciting causes, very little is known. Mr. John Hunter remarks, that it is frequently the tendency to scrofula arises from the climate, which is in many a predisposing cause, and only requires some disturbance to become an immediate cause, and produce the whole disease.—(On the Venereal Disease, p. 25.) The disease is considered to be most common in females; in cold, damp, marshy countries, and in all places, more high mountains, where the temperature is subject to great vicissitudes.—Some voyagers remark, that it is more common in the interior of the island, or towards the mountains, than in the coast.—(Voyage de la Recherche, p. 418.)

In the work cited the last last year, Mr. Hunter takes notice of slight fevers, colds, small-pox, and measles, creating scrofulous disease. He observes, that in particular countries, and in young people, there are sometimes a predisposition to scrofula; and that in such subjects, badness will more readily become scrofulous.—(P. 22.) In short, it was one of Mr. Hunter's opinions, that the venereal disease is capable of calling into action such predispositions as are remarkably strong, and peculiar to certain constitutions and countries; and that, as scrofula is predominant in this country, some effects of other diseases may partake of a scrofulous nature.—(P. 36.) Mr. Hunter, speaking of venereal disease, sometimes has having long suspected a scrofulous cause, and adds, "I am now certain that such cases. I have seen cases where the venereal matter, like a cold, or fever, has only invaded the glands in disease, producing in them scrofula, to which they were predisposed." In such cases, the scrofulous tendency more slowly, give but little pain, and seems to be rather increased in their progress; if mercury is given to destroy the venereal disposition. Some cases of scrofula while under this venereal course; and others, which probably had a venereal taint at first, become so tedious that mercury has no effect upon them; and, in the end, they get well of themselves, or by other means.—(P. 208.) For such diseases, Mr. Hunter used to recommend sweating; and, in case of suppuration, poultices made of sea-water.

Sir A. Cooper observes, that the scrofulous cause of scrofula is composed, in original form, of condensation. The exciting causes, he says, are whatever leads to produce or increase debility, such as fever from disease of a specific kind, the measles, scarlet fever, and small-pox. He notices the greater frequency on this account of scrofulous cases some years ago, when the advantages of vaccination were less known; and the importance of this point to society, if it had no other recommendation.—(See Lancet, vol. 3, p. 78.)

In the words of a well-spared Professor, scrofula readily forms its alliance with almost every kind of affection, occurring either from external injury, or from internal disease; it modifies the appearance of some diseases, and seems to convert others gradually into its own nature. Indeed, there are few of the acute inflammatory affections which occur in this country, in which the symptoms and effects of these affections, and the operation of the feed and remedies employed for their cure, are not more or less modified by the degree of scrofulous disposition, which prevails in the constitution of those who are affected by them.—The

scrofulous disposition, whenever it exists, usually gives more or less of a chronic character to local inflammatory affections.—(Thomson's Lectures, p. 111.)

Docteurin's correspondence to make of scrofulous disease, as defined by Dr. Astruc, "The case," says he, "which seems most obscure, is that the connection of the scrofulous habit with various debilitating causes, may be regarded as follows.—1. The difference in the symptoms and progress of inflammation, when scrofulous, and when healthy, tends to indicate in the former case a larger mass of the stimulus, particularly in the capillary vessels of the diseased part. 2. The scrofulous disposition to scrofula is chiefly transmitted from parents, and is mostly observed in the low, rich, slow, robust, and constitutional delicacy in either sex. 3. There is no state of the body, or every particular known, in which scrofulous action is less easily excited, as the state of great and often permanent fever, which is usually after severe febrile disease, continued long, small-pox, measles, scarlet, or which follows the long-continued use of mercury, as atropine, and mercury. 4. The season in which scrofulous disease has been observed to prevail most in this country, is not that when cold weather has recently set in, and is most productive of disease in general, but the end of the winter and the spring; and they are most easily observed in those young persons who have been in the country, during the continuance of the cold season."—(Lectures on the Med. and Phys. of the Human Body, vol. 3, p. 381.)

It has been the fashion of late years to trace the origin of a great number of diseases to disorder of the digestive organs, little trouble being generally taken to consider, with any regularity, whether the disorder of those organs may not be taken for another effect than the common cause of so many various diseases.

Numerous circumstances tend to persuade the doctor into such a view, particularly one which upon this topic. They are various, I mean, attended with dyspepsia, flatulence, loss of appetite, constipation, and a torpid state of the bowels; they denote that such diseases and the latter complaint of the digestive canal generally derange the health, and, as the functions of the stomach and bowels are deranged, any other disease which the patient may be subject to, either grow worse, or be retarded in its cure; and, lastly, the treatment, in which the theory leads, improves the health, by restoring the state of the digestive canal; and the use of opium, or other cramp, in the end, with the subsequent use of food, exercise, and other favorable circumstances, goes well. But, however simple, safe, and much to be prescribed, it is, and just as the theory which leads to it, there is no proof that the other disease was truly a consequence of the disorder of the digestive organs. The latter symptoms, I believe, in very few cases, no effect whatever for a cure, and perhaps always in its relation to scrofula. Besides, if it were so, it is common (as indeed it actually is), that in scrofulous diseases there is more or less disorder of the digestive organs; but primarily of another important function. I do not see that the advance can stop beyond the truth; because, as the more there is generally proved to be given attacked to this theory, for a new variety of other cases, we can readily see in the dark it is the circumstances which make so ready comparison of different kinds spring from one and the same thing. These circumstances, though hard to detect, being the mystery—until the secret, which is known, and it is known and that the effect is all very happy in particular constitutions, then we are brought back to the position from which we first started. We are thus brought to a disease depending upon some cause, the possibility of recognition, comparative standard, and the points of being excited into action by some cause, or climate, mode of living, &c. However, now I will not have attached sufficient importance to the disturbance of the digestive organs being the cause of scrofula, I feel pleasure in referring for the acquaintance to my part, to the writings of Mr. Abernethy, Dr. Cullen, and Mr. Lloyd, whose treatment appears highly commendable so far as they used to treat scrofula. There is great confidence in various salutary means to improve the health in general, as the most likely mode of having long scrofulous patients, than to encourage such means almost new specifics for the disease. The

far I can follow these gentlemen safely, but no farther, except in a skeptic. However, perhaps some of the believers in the effect of disorder of the digestive system might say, that such disorder is any thing more than one of the many exciting causes of scrofula; and with this qualification their theory may at least not be incorrect. It is the doctrine of Alibert, and instead of merely all systems: "Ce n'est pas le vice de la pureté sanguine, qui prépare le terrain à la scrofule. Il n'est pas davantage son seul développement qui la manifeste, qu'elle lui résiste." &c.—(Nouvel. Nomenclature, p. 418.) "Aliment et air n'ont pas plus les scrofuleux malades." But every explanation, even of curative failures, remains unsatisfactory, so long as we find children living in the same air, under the same roof, and feeding and sleeping together, and clothed identically alike, yet only one or two of them become scrofulous, while all the rest continue perfectly free from the disease. Here, then, we are again compelled to return to predisposition, constitution, climate, and an occasional tendency to the complaint, as a solution of the difficulty. In short, then, respecting the etiology of scrofula little is known, except that certain constitutions probably have a congenital disposition to the disease; that such disposition may be increased or diminished by the operation of climate, mode of life, age, &c.; and that treatment of a threatened kind may avert the disease into action, unless the system is predisposed to it, by inoperable causes. That climate has great influence cannot be doubted, when it is reflected, that the inhabitants of certain countries, in which the temperature is unusually warm, never suffer from scrofula. It is noticed by Sir A. Cooper, that the occurrence of scrofulous swellings promoted by climates, in which the change from cold to heat, and from land to sea-breeze, is particularly frequent, is in the case of this island. But though cold and wet summer lasts this effect, he remarks little progress being in the experience of heat or cold are not affected. The disease, he says, is more common by cold and land, uncombined with a damp atmosphere. On the other hand, numerous children now come from the East or West Indies to this country full a prey to scrofula. He has also known some individuals from the South Sea Islands die of the same disease.—(Lancet, vol. 4, p. 67, 68.) The fact of the great influence of climate on scrofula is equally proved by the effect of the summer and winter, for it is a common and a true remark, that in a mild dry atmosphere, and in summer time, the health of scrofulous persons generally improves, and whatever local complaints they may have get better, while in the contrary winter disorder in winter is more difficult of relief, and either continues stationary, or becomes worse again. Hence, on Sir A. Cooper has justly remarked, the exact value of any proposed remedy for scrofula cannot be estimated, without reference to the time of year when it is tried. There can also be no doubt that, with age, the disposition to scrofula diminishes; for children, much afflicted while young, frequently get quite well when they approach the adult state; and if a person remains perfectly free from every mark of a scrofulous constitution till the age of twenty-five, he may be considered as nearly out of all danger of the disease.

According to the calculations of Dr. Alison, scrofulous diseases are much more frequent in the inhabitants of great towns than in the agricultural population of his country. This seems to him an unquestionable fact, and one that confirms the truth of the connection of scrofula with debilitated cases.—(See Edinb. Med. Clin. Trans. vol. 1, p. 252.)

TREATMENT OF SCROFULA.

"For the cure of scrofula," says Gulliver, "we have not yet learned any practice that is certainly or even probably successful. The remedy which seems to be the most successful, and which can justify us especially as to its use, is the use of mineral waters. But, he adds, in very heavy instances of the use of these waters, I have not been much satisfied that they had shortened the duration of the disease more than had other disordered when we such remedy had been employed. With regard to the choice of the mineral waters, none fit for the purpose, I cannot, with any confidence, give an opinion. Almost all kinds of mineral waters, whether chalybeate, sulphureous, or saline have been employed for the cure of scrofula, and

sometimes with equal success and reputation; a circumstance which leads me to think, that if they are ever successful, it is the stimulatory power that is the chief part of the remedy. Of these, iron-waters have been especially recommended, and employed; but when I am candid, I cannot yet discover its superior efficacy."—(First Treatise of Physic, vol. 4.) On the subject of mineral waters, Dr. Thomson very properly remarks, that they are more usually employed as purgatives and tonic remedies, and not as specifics. In employing them it is often difficult to distinguish between the effects which they really produce, and those which are to be attributed to the slow operation of time, the season of the year, change of situation, variation in the mode of life, or exercise in the open air.—(Lectures on Hygiene, &c. p. 183.)

In scrofulous diseases, Dr. Pottger had a high opinion of bark; and he recommended to prove, that in cases of tubercular glands affected with a tubercle, but not a weak stimulation, it is a most efficacious remedy, and only as a remedy and stimulant. He also holds forward a certain support of bark being a source of cure for scrofulous diseases.—(See Med. Obs. and Inq. vol. 1, p. 185.) Dr. Pottger, in the same work, p. 263, writes in favor of the good effects of bark in similar cases, "scrofulous of tubercle being sometimes given with it."

Dr. Cullen considered the efficacy of bark in scrofulous eruptions and tumors.—(First Lines, &c. vol. 4.)

According to Mr. Harris, bark has been frequently found useful in the cure of scrofulous inflammation, but more often of inflammation than transudation of the glands. Thus, says he, it does not appear to promote, by any remedy, that certain power of causing scrofulous affections, which is attributed to it by Dr. Pottger and several other authors. He observes, that we are not to suppose it will infallibly cure scrofulous inflammation, or tubercles of parts, which, even when affected with simple inflammation, are very difficult of cure. If it be shown to cure a simple inflammation or tubercle of a tendon, cartilage, or bone, we must not be disappointed if even a specific remedy for scrofula were such over-discovered, should prove imperfect in producing a speedy resolution in health. Mr. Harris remarks that bark is often inefficient, because in properly administered. Given in such quantities, once or twice a day, it may prove a stimulant, and increase, too often tonic before, the power of the stomach, or the functions dependent on it; but in order to obtain the benefits of the specific action of bark, he maintains that it should be given in large quantities, for several weeks, with a good diet, air, and proper exercise.—(On Inflammation, vol. 2, p. 373.) Dr. Thomson does not believe that bark or iron has any specific virtue in curing scrofula; but he obtains more either of these remedies and sometimes prove useful in lessening the heat of the digestive organs, when given alone, or occasionally about meals, a course of purgative mineral waters.—(Lectures, p. 277.) When bark is prescribed, the substance of Gulliver is one of the best formulae, as best likely to disagree with the stomach.

As far as I can judge, Mr. White has with much reason recommended paying attention to such circumstances as may have effect in preventing the disease, viz. air, diet, exercise, and dirt. He mentions cold bathing, among the preventives of scrofula, and speaks of sea-bathing as being the best. The chief attention also to be paid to the manner of clothing children, keeping them bare covered in winter than summer. He thought a great deal of sleep beneficial, but this seems only conjecture.

In noticing the treatment of the disease, Mr. White states, that "the present idea of the disease is, that it is a disease of debility (a disease also mentioned by Sir A. Cooper), and therefore, the great object is to invigorate the habit by every possible means; the chief of which are tonic medicines, and sea-bathing. Some are of opinion, that in the case of young persons, this should be continued during the summer months, every year, to the age of fourteen or sixteen. Many recommend it not only in the summer, but throughout the year; while others are for strengthening alteratives, principally the pulsatilla rubra, with or without squill, and the different acids, during the winter; and the sea-water, and sea-bathing, or cold bathing, during the summer. As a continuance of two or three years from the commencement of the disease, with the

general observation, that they will engorge the circulation." Mr. White mentions, as the chief external causes, stagnation and pollution of sea-water. With respect to regimen, some recommended a milk and vegetable diet, others animal food and fermented liquors. But A. Cooper, in particular, who regards the disease as connected with constitutional debility, strongly recommends a nutritious diet of animal food, in preference to one of vegetation.—(Lancet, p. 74.)

Mr. White mentions, that the preceding plans of treatment are not, in general efficacious, except in some instances they may prove useful. "In early affections of the lymphatic glands (scrophulous glands), and from the want of a suitable and proper regimen, when children are delicate and scrophulous, a change of situation to the seaside, together with bathing, when they have acquired some strength, cannot be exceedingly proper; and in good general subjects, who have diseased lymphatics, those proper feeding, and most of necessary exercise, a journey to the seashore may be very useful, particularly if the salt water is drunk when, and in a sufficient quantity to become purgative. This, with the purity of the situation, which may frequently produce an increase of exercise, might answer every expectation; but these plans need cases that with a very little attention are easily cured."—(White on the Scrophulous, vol. 3, p. 104.)

They conclude in which Mr. White's remarks upon this part of the subject end is, that sea-bathing only deserves praise as a preservative, and as the only means of cure. He particularly confides cold-bathing for poor, weakly, debilitated children, whose little veins, enlarged livers, and impure bilious cough, necessarily indicate diseased viscera; such do not support these natural warmth, after cold-bathing, the lungs, and their consequent headache, cold tips, and pale countenances, are sufficient marks of its injuriousness.—(P. 207.)

Dr. Cullen entertained a very favourable opinion of cold-bathing, since he affirms that he had seen scrophulous diseases once benefited by it, after every other remedy.—(Ess. of the Nature of Phlegm, vol. 4.)

"Cold bathing, especially cold sea-bathing says Mr. Russell, is a remedy universally employed in scrophulous, and I believe with great advantage in many cases; for it not only appears to improve the patient's general health and strength, but likewise to promote the disengagement of enlarged glands, and the resolution of the disengorged vessels in the joints, when after they have attained a considerable size, and have continued for a great length of time. But in order that cold-bathing may be practised with safety and advantage, the constitution must have vigor to sustain the shock of immersion without inconvenience. If the immersion be successful by a general glow over the surface of the body, and the patient feels cheerful, and has a keen appetite, we may conclude that the cold bath agrees with him; but if he suffers on coming out of the water, continues chill, and becomes drowsy, we may be assured that the practice of cold-bathing does no good, and had better be omitted.

"In estimating the comparative merit of cold-bathing and warm-bathing in the cure of scrophulous complaints, my own experience, together with the result of different experiments on the subject with some of the most judicious practitioners of my acquaintance, would lead me to believe with more demonstration on the effects of warm-bathing. I should not even be inclined to discourage the practice in cases of scrophulous debility, even from observation, I am fully satisfied with regard to the beneficial effects of the warm bath to patients of phlegmatic constitutions, who were much affected with enlarged scrophulous glands. Several of these instances occurred in young women, about the period of life, who were in all respects healthy and vigorous, sharing the swellings of the glands and these symptoms of disease which were connected with fulness of blood.

"The essence of the warm bath is exceedingly grateful to most patients, and the practice is extremely safe. It may be employed at all seasons of the year, and in all weather, without danger or inconvenience, the risk of suffering from exposure to cold immediately after immersion in the warm bath, having been much exaggerated by prejudice. There is not even any good reason to believe in the expense of such a bath. The water itself, however, which is employed in warm

baths, are perfectly innocent; and, provided they do not become very excessively and uncommonly hot, which is the exception, but is guarded, as far as to remove the patient's mind from marasmus and pseudo-scurvy affections.

"If regular sitting waters, and sometimes spring waters, be resorted to, the late effects of warm-bathing in relieving scrophulous complaints; but as the practice is not attended with any inconvenience, but followed by any bad consequences, there can be no reason to be given the contrary till the trial be completely satisfactory; and I am convinced that the practice of taking bathing in cases of scrophulous will be more generally adopted after the knowledge of its beneficial effects are more widely diffused.—(See Russell's Treatise on Scrophulous.)

Nothing can be more satisfactory than Professor Thomson's tangible evidence which is so striking in the efficacy of the essence of soda, as it relates to scrophulous. In reading this, one may wonder how an effluvia so healthy should ever have fallen into neglect.—(P. 126.) In subsequent passages, however, the most gentlemanly evidence only a limited confidence in the means of relief. "Local sea-bathing, hot and cold waters, has often appeared to be of use in promoting the resolution of scrophulous swellings. The suspension of the bath must always be varied according to circumstances, according to the season of the year, the strength and habits of the patient, and the progress of the cure which the bath seems to produce. It is at all times difficult to distinguish between the scrophulous history arising from the scrophulousness of the system, and those which arise from the increased warmth of temperature in the bathing season of the year; from the exercise which patients going to sea-bathing necessarily take in the open air; from the change of situation and countenance; and, leaving the point stated, that the more resolutely diet and abstemiousness in what they are actually perspired to induce, as in their residing at sea-bathing quarters. It is not impossible, that those living on the seacoast, who become affected with scrophulous swellings, be thereby cured, derive equal benefit by going down the seacoast to reside in a place the situation of the country.—(See Thomson's Lectures, &c. p. 203, 204.) A still later writer declares he believed, that cold sea-bathing has a specific power over the disease.—(Lancet, Scrophulous, &c.) Yet the same surgeon is sensible of practical truth, will we can whether any plan has a specific power, or not, we can complain. If that disorder is sometimes relieved by it. And that this is the fact is admitted by Mr. Lloyd, when he says, "cold sea-bathing, however, is certainly useful, when judiciously applied."—(P. 41.)

With regard to decoction, Mr. White remarks, indeed, when done length of time the enlarged glands have acquired a degree of hardness and immobility.

Mr. White, after explaining stricture in the stomach, and diet, as preventive of a stricture as well as a preservative of the disease, proceeds to explain his own practice. The first external symptoms, such as swelling of the lips, side of the face, and of glands upon the chin and round the neck; also other symptoms usually denoted as stricture, viz. hardness of the skin, eruptions on the back of the head and different parts of the body, redness and swelling of the eyes and ears, are accompanied, according to Mr. White's conception, with an inflammatory distension, though without such as to require bleeding. Called with the medicines which this gentleman recommends in the treatment of the foregoing complaint. It is not safe given to such quantities as to render it a specific cure, either by the intention to cure it, but in small doses to soothe. Thus says Mr. White, "It is usually larger in the intestinal tract, a great quantity is taken into the milk, and the patient is susceptible of cold than what makes in the disease. The first and perhaps the second dose may prove purgative, which is in general necessary effect; but afterwards, the same quantity will induce no more; it is sufficient to keep the body open; and should be of service for that purpose. I have stricture with it, and it is usually purgative, even after it has been treated, according to the common practice. If this could be a preceding medicine, a few grains of the oil with it, or even of some mucous powder, may be added to the medicine. By this simple method, however, Mr. White, that of the symptoms before mentioned will, in a short time, disappear; but if the patient

World contains land, and retain their space without striding innumerable miles, as many divers have been from external applications, particularly the steam of warm water. I have used a variety of medicinal baths from nature, but am inclined to believe that the advantage was particularly derived from warm water. At other times, I have directed the patient to lie with electricity, stimulating the pulsat, and drawing sparks from the tumor, with a slight figure of inflame the tumor was united. After the application of the steam, or the use of the electrical vesicator, I have sometimes rubbed a tube of the ammoniacal volatile oil, the balsam and neighbouring parts, in applied the ammoniacal applications or ammoniacal cream, water, or oil to the system, as a stimulant and evacuant, of course, and by osmosis. Dr. Ware adds, that in such cases, if the tumors should suppurate and burst, the parts will, in most instances, heal without much trouble. For eruptions on the head, he recommends applying the wet return, alum, camphor, or the Great Oil, once every second day. For the roughness of the skin, which is generally followed by eruptions, he also advises the ammoniacal vesicator (see last article), calomel, solution of sal tartar, or of the hydropic acid, as outward applications. "That last says Mr. White will seldom fail to check the progress of the complaint, and, dry the sores; and, in the quantity of half a pint of warm water, the use of a full seton is productive of any pain. If the eruption should increase, and require any unguent application to prevent the adhesion of the flaps, the ointment below mentioned may be applied; the best remedy will be warm bathing, and, when practicable, the hot-water bath a preference."—(P. 114.) The author next mentions his having occasionally recommended the virtues of emollient, tumour extract, from yam, hyacinth, domestic species, or cornelian; and that he sometimes found advantage derived from attractant drives. We need not doubt this professor's mode of treating affections of the eyelids, as he is a native of Switzerland, whence the eye and eyelids are the articles of business and of knowledge.

For the sake of individuals in the laundry, remaining safe, sanitary, abstemious, Mr. White speaks very highly of the effects of the steam of warm water; and cautions his agents unhesitatingly employing calico which will often affect the sensitive little, but the child readily. Mr. White assumes his sweeping is made on machines large enough to hold a gun and a half or two pairs of boiling water. From the top proceeded a narrow pipe, ten to twelve inches long, through which the steam passed. Near its end, which was flexible and curved, was a point for the greater convenience of directing the steam to the desired parts. The water was easily kept boiling by means of a lamp under the machine. Mr. White says that the agents should be employed twice or three a day, and a piece of flannel or cloth afterward applied. The body should also be kept open. In climatic unhealthful areas, mercurial preparations, according to Mr. White, need likewise to be given, and if they affect the child much, inoculation should be suspended.—(P. 117, 118.) For extreme eruptions of the face, resorted to be antiseptics, I would very particularly recommend a trial of calico, which should be used both externally and internally.—*Free Inquirer.*

When the glands of the neck or other parts of the body tend, to a state of suppuration, it is very slowly, the skin appearing gradually this and of a deep red color, and the tumor swelling forward. In situations, Mr. W. never recommends the use of the lancet or caustic, for an artificial opening is made, it will be a long time before the skin gives way; and when it does, the opening will not only be very small, but often unfavorable in its situation. Mr. W. adds, that the contents will often be found to contain more pus, or like a salivary of body; and the pus keeps well contained for a great length of time if no opening is applied. He found a solution of pure hyposulphite of soda when used more freely, and the constant application, or some similar outward application, the best method of treating the disease.

We need not describe Mr. White's powder in the minutest of scientific particulars, as the subject is fully considered in the article before us. It appears, however, that he confirms the efficacy of silicate of soda in whitening and preserving white surfaces, when the surfaces are

loss are affected with stream-of-consciousness—(F, ID). What may be done in these cases by the patient and mental use of idiosyncrasy, remains to be proved by further experience; and it is certainly a prediction, the power of which is probably outside the patient's imagination.

Wheaton improves the practice of Mr. White in administering calomel, occasional purgatives, the different laxatives, emetics, &c., with the slow pill, cathartics, and laxative treatment of the present day, but persists in very material differences between them, especially when the struma is such Mr. White takes upon attention is diet, clothing, &c., is taken into the account. Mr. Lloyd, who has obtained Mr. Alcock's promise is confident, says it does not in his opinion that "the disease is only to be cured by removing all sources of irritation, and restoring the natural and healthy functions of the digestive organs."—(P. 45.) By means of leeches, Mr. Lloyd removes existing spasm; the active is therefore removed, so far as it can be followed, in such cases as are locally known. The restoration of the functions of the digestive system is also a thing worth aiming at; and the only difference of my views from those of Mr. Lloyd is that I look upon the disorder of the digestive organs to be in general only a complication or effect of the system, such as, ulcer, abscess, diseased joint, &c., and not the causing cause; the treatment, when beneficial, depends on our on the principle of improving the general health, by the removal or diminution of one of the most fatal consequences of the original disease. It is hardly necessary to inform the profession that the treatment described by Mr. Lloyd, in addition to the usual advice about diet, clothing, and avoidance of damp and cold, and the utility of good air, exercise, &c., consists in giving the patient five grains of the gel. hyal. every eight or half a pint of sweetened, orange, &c. triacate. And it is a certain loss of the day, were he bent on mercurial measures as had to opening medicines. This plan is powerful if the humors become copious; and then, with a view of preventing a relapse of the humors into their former state, Mr. Lloyd continues the exhibition of alterative doses of mercury in an moderate time, the pills now being given to the powdered calomel pill, is doses of five grains three or four times a day. In this practice is exactly like that of Mr. White, viz. small doses of calomel with purgatives. When acidity prevails in the stomach, small doses of soda air is recommended; and when the stomach is weak, with loss of appetite, chills, shivering, and calidness of the body. A further, with pepper and wine, is disapproved of, as already stated, not as a counter to be placed in one bottle.—(Lect. on Scrophula, a. 26.)

[illegible]

conceitly proposed the marriage of these; but its effect is very God-fail, and inconsiderable. "Professor Emerson says Mr. Russell had fringed me with the string observations with collected apoplexy in 1855. I employed marriage of him in various cases of vertigo, without having derived benefit from it; in a single instance. These patients, indeed, he admits, not well his leader a source of surprise of these; but then he led an opinion to accept the case in the effect of the vertigo. In order to do this, the contrary, the disease has produced severe sickness and depression in himself, and the patients got daily worse. In the state of him was required, and only a few days employed. The relief experienced from the vertigo, on of the marriage of him, led to a double with regard to the marriage effects which the use of it had pro-

wood, with sulphur and calomel, or the subcarbonate of soda, with rhubarb and calomel. — (*Lancet*, vol. 4, p. 34.)

As beyond the highest merit, the sulphate of quinine, and the preparations of iodine, should also be recommended.

The local treatment preferred by Mr. White has been already described. I have only a few words to add concerning this part of the subject. Dr. Colles states, that, in his practice, he had very little success in discussing scrofulous tumours by topical applications; and that a solution of the succatum saturni, though sometimes useful, was frequently failed. Dr. Colles found the aqua ammoniac not so more successful. "Fluorides of silver and lime have been frequently found to be fatal; and poisons seem only to bring on a suppuration. I am doubtful, if this last be ever procured with advantage for scrofulous tumours, supposing judiciously to suppose, but never after any degree of inflammation has come upon them; and, therefore, poisons, which constantly induce inflammation, prevent that absorption of tumours which might otherwise have happened." These views scrofulous tumours have advanced towards suppuration, Dr. Colles thought, that inserting the aqueous opening, or making one with a lance, was useful.

With respect to ulcers, Dr. Colles remarks, that antiseptic preparations of either mercury or copper, have been sometimes useful in bringing on a proper suppuration and thereby disposing the ulcers to heal; but they have seldom succeeded, and, more commonly, they have caused the ulcer to spread more. The mechanism from which Colles says heat began to rise, was first, skin mixed with some mild ointment. But this conducted matter gives the weakness in keeping the sores continually covered with linen wet with cold water in the daytime, and some ointment at night. He usually found an order too irritating, and its removal sooner better than constant water. — (*First Lines of the Practice of Physic*, vol. 4.)

Formerly, the corruption of scrofulous ulcers was unfixed; but this method is now considered as being, for the most part, ineffectual and unnecessary, with the exception of diseased joints, and a few other parts, which frequently require being amputated, for the sake of saving the patient's life. Certainly no particular drugs (generally speaking) would almost calling out scrofulous glands and tumours; the objections to the plan are founded on the pain of the operation; on the number of such glands frequently existing; on their often subsiding, either spontaneously or by surgical treatment; on the operation doing no good in the general affection of the system, &c. When, however, a scrofulous testicle, bone, or joint, seriously impairs the health, and endangers life, the very existence of the patient demands the immediate removal of the diseased part. Wiseman states, that he was in the habit of letting out scrofulous glands and tumours with great success; but, for reasons already offered, most of the moderns begin with operation in general unadvisedly.

Caustics have been employed for the same purpose instead of the knife; but as they effect the object as slow as certainly, more painfully and seriously, and cause extensive ulcers, they are disused by all the best surgeons of the present day.

Some authors have advised eating liver, and keeping their faces in order to prevent any ill effects from the breathing of scrofulous air. There are certainly quite unnecessary for any purpose of this kind; but they are extremely useful as a part of the local treatment of scrofulous joints and ulcers, as we have seen, particularly mentioned in the articles *Joint*, *Liver*, *Ulcers*, and *Wounds*.

Mr. Bristle states, that leeches have hitherto been chiefly used in diseases of the bones and joints; but he adds, that it is reasonable to suppose, that they might likewise be useful in the cure of enlargements of the glands and other scrofulous tumours, if inserted in the most judiciously of the part. The only objection to their use is the fear which they have, and which, in certain situations, one would particularly wish to avoid. When the tumour is thickly covered with the integuments, the leech may be made directly over it, and kept open with the above ointment. In other cases, a small pea size or more, may be in-

serted by the side of the tumour. This method would be objectionable for scrofulous glands in the neck, in consequence of the risk, but it might be employed when the tumour is situated. — (*Illustrations on the Scrofulous*, vol. 2.) The late Mr. Croxall used to apply blisters to scrofulous swellings, and maintain a discharge from the part. And a more ready process is that of producing irritation of the integuments, by vesicating tumours and abscesses, by means of the tartar emetic ointment. — (*Illustrations on the Scrofulous*, p. 162, &c.) The good effects of iodine upon scrofulous tumours, kept as an internal medicine and local application, seem now to be exciting considerable attention. Dr. Smith has made writings of the medicine and breast, in particular, yield to this powerful medicine. — (*See Index*). The profession, however, are still in want of some decided and accurate reports upon the subject, which is at present obscured by the speculations always attending the first introduction of a medicine, supposed to have power over any disease that has been found so little under the control of physic in scrofula. I beg, at the same time, the attention of every surgeon to the strong recommendation with which iodine has been brought into notice, and to its great medicinal powers, as already verified by thousands. — (*See Illustrations and Index*.)

Preparation of lead, chalks dipped in cold water, and water, or weak vegetable acids: rubs; sea-salt mixed with life; the ammoniac liniment; a mixture of ether and the trinitrate system; and leech positions; from a long list of applications, which have been employed for scrofulous tumours.

According to Mr. Burns, moderate pressure, by means of adhesive plaster, wrapped with one application of cold water, is one of the best plans of treating scrofulous ulcers, when their situation admits of it. In other cases, he recommends applying a powder, for years of which causes of various sorts, and the salt of tartar alone. A piece of dry flax is used to be applied, and a compress, wet, with a mixture of castor oil and water, is used occasionally to keep the compress in cold water.

The use, most in a good constant dressing, when it is needed, is in scrofulous sores with the progress of the ulcer. The mag. hydragr. nitric rub, and strong hydragr. nitric, are the best stimulating dressings. Positions of bread and sea-water; solutions of alum, solutions of copper, and the hydragr. nitric, solutions of the nitrate of copper, arsenic, and silver; the rectified spirit of the wood-spirit distilled; flat dipped in lemon juice, or vinegar and water; a mixture of ammoniac and cerium, superin. (Scott on Chronic Inflammation, &c.) are among the applications to scrofulous ulcers.

For treatable sores, diluted hydrophosphate of arsenic, containing containing opium; cerum and liniment positions; a solution of opium; and carbonic acid gas, are sometimes recommended.

The following are Mr. Russell's sentiments respecting the treatment of scrofulous sores: "Scrofulous conditions in general do not agree well with stimulant applications. In the treatment of scrofulous ulcers, under the ordinary circumstances of magnitude, the simplest and mildest dressing answers best. When the patients are using a course of sea-bathing, it is usual to wash the sores with sea-water, and above the necessary application of the sea-water being the treatment of the whole body. Cold spring water is likewise a favourite application with many practitioners; and from much observation, it appears that the application of cold is well suited to counteract the state of inflammation which accompanies scrofulous sores. Preparations of lead are, upon the whole, very convenient and useful applications, provided the solution be used in a state of sufficient dilution to prevent irritation. Liquid applications are applied by means of wet flax, which is covered whenever it dries, so that the surface of the sore may be kept constantly moist, when under treatment of treatment. Upon the same principle, simple ointment and Royle's cerum furnish the best dressing in ordinary cases.

Scrofulous eruptions of a solid nature, in the more external parts of the body, are little adapted to the practice of local dressing, unless they be attended with symptoms of inflammation, but as soon as they

elderly laboring with regard to the cause of the complaint, which has been referred to the irritation of sea, and this alone, in a supposed peculiar condition of constitution, not defined, not taken at all seriously.

Mr. Pott, as we find, describes the disease as always beginning at the lower part of the scrota, but there are exceptions. Mr. James Esdaile has recorded an instance of its origin from the root of a gland, which had been employed in displacing root for the destruction of a stump, and some cases are said to have taken place in the foot.—(*Ed. Earle on Med. Chir. Trans.* vol. 12, p. 255.) One circumstance is noticed by the latter writer, which, if it prove generally correct, naturally influences the prognosis and treatment. He says, "the inguinal glands are often enlarged, but they will generally subside on the removal of the diseased scrotum; thereby proving that this disease is not excessively communicated in the nature of the abscesses."—(*Id.* p. 255) He seems only one exception in this statement; a case where a testis, lamed, suppurated, and increased the size of the scrotum as the primary affection in the system.

If there be any chance of putting a stop to, or preventing this mischief, says Mr. Pott, it must be by the immediate removal of the part affected; namely, that part of the scrotum where the sore is; for if it is suffered to remain until the testis is affected, it is generally too late even for castration. "I have many times made the experiment; but though the scrotum, after such operation, here in some instances healed kindly, and the patients have gained from the hospital seemingly well, yet in the space of a few months, it has generally improved, that they have returned either with the same disease in the other testis, or in the glands of the penis, or with such was complicated, with pale tender countenances, such a total loss of strength and such frequent and severe internal pains, as have ultimately proved a diminished state of some of the vessels, and which have some been followed by a painful death."—(*Id.*)

Mr. Esdaile's experience has taught him, that no topical applications, nor internal medicines have the slightest influence over the disease. The scrotum, he says, is the only resource, and it may be supported with confidence provided the whole of the diseased mass can be removed. Even when the inguinal glands are enlarged, he advocates the same practice. Also, when the testis is affected, provided the spermatic cord is sound, he advocates, that it is right to give the patient the chance of recovering; and when considering the desperate results of Mr. Pott's operations in this case of the disease, he has seen the almost successful cases, is which no relapse had happened several years after.—(*See Pott's Works*, vol. 3, ed. by Esdaile. Also, *Mr. Esdaile's Essay on Ecthyma*, to which are added the *Chancery* and *Cancer*, &c. *Medicines*, 1852. *Ed. Esdaile on Chancery Cancer*, in *Med. Chir. Trans.* vol. 12, p. 256, &c.)

SCROTUM, *Sarcinoma* Thickening and Induration. The improvement of Esdaile's local treatment is better, than cases of enormous growth of the scrotum are extended to women, scrotum, as, at least, that they are released, directed to cold cauterization, since most of the scrotum which have been seen in Europe, except from Asia and Africa. The scrotal tumor of Desfontaines, formerly considered of external solution, says Esdaile, is perhaps the only well authenticated instance of the growth of such a disease in our own climate; and it is so, much smaller than the instances related in the *Epithymides* German, for the year 1802, in the scrotal writings of Desfontaines, and the scrotal tumor of Desfontaines, and those which Esdaile has treated in most men in Egypt. The scrotum of Esdaile, after they had reached their full size, weighed more than 25 kilograms (between 50 and 75 pounds).

Several cases of this enormous disease are recorded by other writers, particularly by Dr. Cullen, Dr. Tully, and the celebrated Desfontaines. Esdaile says, in Mr. Desfontaines's specimen, a considerable fleshy substance, which was a portion of diseased scrotum.

In the case which Esdaile had an opportunity of seeing in Egypt, the scrotum was, and when the operation was executed, was laid below, and exposed from the sides by a sort of pedicle. "Esdaile (on Esdaile's scrotum), the scrotum presents a pedicle of fat, from which is projected by particular lines, containing, which the scrotum is a part of the scrotum, and

respond. Upon a large portion of its surface, especially when the case is of long standing, yellowish scaly crusts and always seen, the detachment of which immediately leaves to many small fungous ulcers, emitting an offensive discharge. The tumor is soft and fluid at some points, but solid at others. It may be handled and pushed in different directions, without the least pain. The patient is only annoyed by its weight, and the impediment which it causes to his walking walk. Hence, he is recommended to employ a suspensory bandage. In consequence of the situation of the scrotum, the urine discharges over the swelling, but without causing any irritation. In most of the cases, such by Esdaile, the spermatic cord and testicles were in the natural state, situated at the sides and at the root of the swelling. The spermatic vessels, however, were somewhat enlarged and dilated. All the patients were likewise more or less affected with elephantiasis.

Esdaile, Esdaile attempts to explain the cause of the complaint in Egypt, but, we think, without any degree of success. As the affection is seldom seen in cold countries, climate has probably a chief effect. Esdaile remarks, which long becomes a good deal in a strong position; the scrotum, however, were in the Egyptian, and the consequently perishing state of the scrotum, the cause of the tumor, and particularly their situation, on the part, a necessary consequence of syphilis in that country; had perhaps, almost of every; and the moderate use of the warm bath; and the moderate use, which will not bear the heat of removing.

The enormous magnitude which this scrotum disease may attain is almost incredible. The case recorded in the *Epithymides* German, weighed about a hundred kilograms, or more than two hundred weight. Another, described by Esdaile, was calculated to weigh about one hundred and twenty pounds; and this scrotum, however, was in Egypt, but of more moderate size, nearly as large, and all of the same character.

A very curious example, in which a similar disease affected the labia pudendi to a surprising degree, is also detailed by Esdaile. The woman was a native of Cairo. In the early stage of the disorder, we may be permitted to suppose, confirmed with scaly crusts, ulcers, and excoriated with scaly crusts, before reaching the stage, and, or the excitement of mercury, the scaly crusts, of the scrotum of elephantiasis. These scrotum, as we are assured by a scrotal, scrotal, scrotal, scrotal, and the application of caustic, passed of scrotum, and Esdaile very properly continues with experiment.

When the disease reaches every stage that is to be feared, and the scrotum reaches the patient's life, it is a case of death, scrotum, the operation of the scrotum with a knife becomes proper. In this proceeding, the chief skill consists in doing so lightly to the spermatic cord and testicles, which are generally perfectly sound. As the scrotum of the scrotum is not furnished with large vessels, the hemorrhage need not be feared. Care must also be taken not to wound the corpora cavernosa penis, and the urethra. After the operation, the skin is to be brought over the diseased scrotum as much as possible, with adhesive power and a bandage.

Mr. Desfontaines successfully removed the diseased mass in the scrotum of the French market Desfontaines, and Esdaile performed the same operation with success when he was in Egypt. Dr. Tully, of the scrotum of the Christian, who returned with a tumor, which weighed seventy pounds, and the patient, who was a negro, and also affected with elephantiasis, severely recovered.—(*See Esdaile's Works*, vol. 3, p. 25, &c.)

It is probable that some of the cases which occur in warm countries, are analogous to the elephantiasis; but I do not believe that the scaly crusts which are represented by Esdaile as occurring in the cases which he saw in Egypt, have been shown to exist in the instances which have been given in cold countries. Now, indeed, did they take place in the scrotum recorded by Dr. Tully, the scrotum of the patient having been in the scrotum.—(*Esdaile's Works*, vol. 3, p. 25, &c.)

ESDAILE. The operation of removing a scrotal tumor, through the scrotum, into the bladder, for the purpose of amputation, is known to the patient for a while to see.—(*See Esdaile's*)

smaller than they really are. This is the only case in which stimuli of being treated as a distance. The eye, however, producing the disorder is usually acted on by individual causes, and certain occupations, and such conditions as impede the nerves. A supposition of perception is alleged to be sometimes a cause.—(*Archiv. f. Ophthol. der Wissenschaft.* i. 2, p. 265.)

A sound eye likewise does not always judge with accuracy and consistency of the magnitude of objects. This may arise from three causes. In order to judge rightly of the size of any thing, its position, distance, must be known; for the more remote it is, the smaller will it seem to the eye. Hence, any misapprehension respecting the magnitude of an object, is constantly connected, unless the distance be ascertained. This is invariably something relative. A single large object, surrounded by many smaller ones, always appears to be larger than it really is; as this vessel, an object whose magnitude is known seems smaller than it actually is, when one has been a little previously looking at numbers that it still larger. Lastly, the refraction of the rays of light in the eye, by which objects as they are made to appear large or small, is also always accompanied in the same degree, as the eye seems to find things equally felt and distanced with its lens. Hence, if one sees the same object well appear in the same eye, and at the same distance, larger; or smaller than usual. Sometimes, however, the eye judges as to the size of the magnitude of objects, and there is power by regarding the case as an infirmity or disease. It is for the most part owing to a defective sensibility in the nerves, caused by some disease of little or nothing upon the eye, and is generally seated in the optic system. A man is seldom easily thing seemed too small; and never than a really was, was cured by means of an emetic, bark, an opium, and opium.—(*Lehrb. der Augen.*)

Sometimes to the eye, under circumstances of disease, straight lines appear serpentine; perpendicular objects straight; things standing upright, to be inclined, &c. The son of a distinguished artist began when seven years old to learn drawing under his father, who was much surprised to find all the objects which the young pupil represented drawn upside down. It was at first supposed, that the child might be practicing the reverse of objects in joke; but he affirmed that the things were drawn exactly as they appeared to him, and there was no manner to doubt his word. When ever an object was turned before he took a sketch of it, he represented it in the natural position, showing that the irregularity occurred by the eye corresponded perfectly with the inversion formed on the retina. This state of vision existed at the end of a year.—(*See Journ. Med. Arch. der Naturg.* 1861, Feb. 1862.) All the preceding cases are not done by Richter as depending upon a sensory peculiarity of the nerves, occasioned by the effect of some stimulus. The irritation, he says, may be of any kind; but experience proves that it is mostly seated in the optic system. These defects of sight may generally be cured by first eliminating causes and purgatives, and afterwards, having recourse to remedies for strengthening the nervous—bark, alcohol, iron, male, vitamin, issues, &c. One mark of a very weak and imbecile eye is, when objects after being looked at a good while, and presenting a right appearance, begin to swim, drift about, mix together, and at length become quite unrecognizable. This peculiarity happens when the objects retained are small and strongly dissimilar. Here some remedies, both general and local, to have the effect of invigorating the nerves are required. However, sometimes the infirmity is partly owing to the operation of some species of irritation, which will require removal, as the tonic remedies and applications can avail. Indeed, in particular cases, the disposition of such irritation is alone sufficient to accomplish the cure.

Sometimes all objects appear to the eye as if they were in a more or less dense mist. This defect is visible to almost every eye either in some slight capacity of one of the features of the eye, or to excessive debility of the optic nerves.—(*See Richter, Archiv. der Wissenschaft.* i. 2, p. 333, &c.)

SINUS. A long, narrow, hollow track, leading from some sheath, directed bone, &c.

SOUND. An instrument which surgeons introduce through the nostrils into the bladder, in order to determine whether there is a stone in the vesica or not.

The sound is made of highly polished steel, that it may be used most effectively covering up to the surgeon's finger the assistance of any thing against which he can say strike. It is also generally rather less curved than a catheter, so that its curvature may be more easily introduced to the lower part of the bladder, where the stone is most frequently situated.

SOUNDING. The operation of introducing the sounding instrument.

Sounds are generally introduced much in the same way as catheters, either with the curvature towards the side of the vesica; or the curvature towards the side of the urethra; in which last method it is necessary, as soon as the head of the sound has arrived in the prostatic urethra, to bring the handle of the instrument downwards by a semicircular movement to the right, while the other end is kept as much fixed as possible. This is what the French term the *curve* or *tour de sonde*; a plan that is often followed at the present day, though, except in very suppurated subjects, it has no particular recommendation.

When a patient is to be sounded, he is usually put in a posture very similar to that adopted in the lateral operation. For the stone, with the exception that he is not fixed in this position, as there is sometimes an advantage in making the patient stand up, in order that the stone may come in contact with the end of the sound. The instrument, having been introduced, its extremity is to be moved and moved in every direction, until it there be a catheter, the pressure will usually be indicated by the motion against the back of the sound.

Surgeons have sometimes both fixed in the bladder after death, although they could never be discovered with a sound while the patient was alive, suffering all the symptoms of the calculus. The celebrated French surgeon, M. Pons, has also circumvented, as he was so fully convinced of there being a stone in the bladder, sometimes rather to his regret, as he has been told, not to use a sound, that, on the contrary, he gave directions for ascertaining the fact. Hence, while the sound symptoms of a stone in the bladder continue, patients should be sounded several times before a positive opinion is delivered respecting the nature of the disease. When, during the operation of sounding, as the stone has escaped from the bladder, the inner surface of the vesica comes into contact with the end of the sound, and such a sensation may be communicated to the surgeon's finger as leads him to suspect that a fungus, or some other singularly sensitive substance is contained in the bladder. In such cases patients have actually been cut for the stone, when no foreign body whatever was present.—(*See Richter, Archiv. der Naturg.* i. 2, p. 271, 272, &c. 2. *See Zinkow.*)

SPECULUM. An instrument to facilitate the examination of parts, and also the performance of operations on them: thus we have speculum, nasal, anal, &c.

SPIRACULUM. (From *spirare*, to destroy.) Synonymously, by this word, complete incision, which is usually preceded by a stage of the disorder, termed gangrene. *See Rheumatism.*

SPICA. (From *spica*, an ear of corn.) A name given to a kind of fissure, is consequence of its form being thought to resemble the ears of an ear of corn.

In order to apply the spica bandage to the shoulder, the margins of the assile tract, that is protected from the effects of the pressure, by means of soft compresses, and covered of a common roller as then to be placed under the armpit, in the axilla itself. After conveying the bandage backwards, obliquely over the scapula, the surgeon is to bring it forwards over the injured shoulder. The roller is then to descend under the armpit, then to be carried upwards again, and made to cross at the distal vessels. It is now to be carried obliquely over the front of the chest, and under the axilla a second time, where the end of it is to be placed or stitched. The bandage is next to pass across the back, over the part of the roller previously applied in this situation, and is to be conveyed round the head of the scapula, so as to form a *tricus* or *delta* with the first circle of the roller. There are four *deltoidei* or *tricus*, each of which covers about one-third of the preceding row, are to be made, and then the upper part of the arm is to be care surrounded with a plain circle of the bandage. This last circular application forms between it and the cross previously made a triangular equilateral space, technically named by writers *gros*

with sticking power, and, if possible, limit. Another accumulator is likely to be provided, if practically warranted, and logical applications. Mr. Dixon lately actually made the experience of a positive air connection between, in water, indeed, the water had previously had liquid nitrogen. The pressure was repeated every third day for six weeks, during which time the child's health continued unstable. The wounds were gradually healed, but the places having been rubbed off one of the punctures, the gas often met the opening could not be healed, the discharge, first having been of an aqueous nature, became purulent, and soon escharic. This case was also attributable for the ill of the method, as the large amount covering the stanzas were flamed, and had no disposition to contract.

The married pair, assisted by Sir Aubrey Cooper, will serve to show the benefit which may be derived from training.

Johns Appleton, Baltimore, Md.—My son, now born on the 19th of May, 1867, and his mother, immediately after his birth, observed a tumor, and inflammation, on the back, of the size of a large walnut. On the 22d of June, 1867, the child was brought to my house, and I found that, notwithstanding the inflammation, the head was not excessively large; and the eruption of the legs were pointed; and the limbs and trunks were discolored extensively. I applied a cataplasm around the child's waist, so as to compress the tumor, being directed so to do so from considering it a species of hernia; and that the deficiency of the spine might be compensated for by external pressure. The pressure made by the tumor, had no unpleasant influence on its pulsatory power; it actually and twice continued to be properly discharged, but the mother feared that the child was excessively convulsed. At the end of a week, a piece of plaster of Paris somewhat thickened, and that below, partly fixed with a piece of horse hair, was placed upon the surface of the tumor; a mass of adhesive plaster was applied to prevent its falling to the ground; and a roller was roundly secured the waist to bind the plaster of Paris firmly upon the back, and to compress the tumor so much as the child could bear. This treatment was renewed until the month of October, during which time the tumor was enlarged about three times a week, and the mother reported that the child was occasionally convulsed. When the child was five months old a brace was applied, and it is seen to that which I sometimes use for scapular hernia in children, and this has been continued ever since. At the age of fifteen months, I began to make use of my splint; it could travel almost freely and support a pair of pants. At eighteen months, by some accident, the trunk slipped from the splint, which had become of the size of a small hoop, and the mother observed, when it was restored that the child appeared in some degree ill; and this was always the case, if the brace was left off for a few minutes, and then re-applied. At fifteen months, he began to walk, and at that time of age, he could walk alone. He never grew to crawl, run, jump, and play, except in other children. His position of mind did not appear to differ from those of other children. His memory is retentive, and he learns with facility. He has the vowels and small part of the first year, and the beginning of the second year. His head previously and subsequently to the tumor closing, has possessed a disposition to come partly of the body. The tumor is kept by the brace entirely within the clasp of the splint; but when the brace is removed, it comes because of the size of half a small orange. It is therefore necessary that the use of the brace should be continued. When the brace is removed, the tumor can be readily passed through the frame over the clasp of the splint. —*Med. Chir. Trans.*, vol. 2, p. 251, &c.

The story was also published by The Audley Cooper, and points that since Britain may sometimes be treated in another place, so as to avoid a permanent one.

[illegible]

finding that if the whole was treated, the process would be far great upon the lesion. I thought it a fair opportunity of course was taken by the effect of treating the swelling by means of a very fine pointed instrument, and by subsequent process to bring it into the state of the sperm habit in America's child. I therefore immediately provided the father with a strychnine, and made it about two ounces of water. On the 10th of January, finding the disease no longer to move it had been pronounced, I opened it again, and in the same manner, and discharged about four ounces of pus. The next day when the fluid was to be treated, on the 15th it was found that it had become more fluid, and I opened it again. On January 22nd, the disease was as large as at first; I opened it again, and discharged the fluid. A strychnine was applied over the incision and around the abscess. February 1st, it was again opened, and three ounces of fluid discharged. On the 15th, three ounces of fluid were discharged. On the 18th, the same quantity of fluid was evacuated as on the 15th; but instead of its being perfectly clear as at first, it was now opaque, and it had been gradually becoming so in the three former operations. On the 20th, the same quantity of fluid was taken away; it formed a layer was found over the incision and around the abscess; a piece of gauze was placed upon the fluid rather over the incision, and another piece over the puncture to make it. On the 21st, three ounces of fluid, of a more liquid kind, were discharged; the strychnine was again applied. On the 22nd, the same quantity of fluid was taken away; the fluid was now more opaque, and the child suffering considerable constitutional irritation, was ordered calomel and ipecacuanha, and the rules were discontinued. On the 23rd, the disease was not more than a quarter of its former size; it did not swell; the integuments were thickened, and it had all the appearance of having undergone the adhesive inflammation. On the 26th, it was all well reduced in size, and felt solid. March 3rd, the swelling was very much lessened; the skin over it thickened and granulated; a crust was again laid over it; a crust was put over the incision, and a second strychnine was applied. March 12th, the disease was much reduced, the skin covering it was a little enlarged. On the 15th, it was that was still a little enlarged. On the 27th, the effused considerable lymph was considerably reduced in quantity, and of a very fine texture. On the 28th of May, nothing more than a little protrusion of skin remained, and the child appearing to be perfectly well, the bandage was removed. On the 10th of the 29th, the child was attacked with the measles, and went well through the disease. The skin now large facial from the base of the neck; the centre is darker in the middle which is marked, and the appearance of a wart is produced in its tendency towards the skin. The pucker of the neck is very obvious, leaving slight indentations. (See *J. Med. Chir. Trans.* vol. x, p. 287-289.)

At the time when Sir A. Cooper presented this case to the Medical and Chirurgical Society, it had been under his observation two years and a half.

The first of the preceding observations emphasizes the patients' treatment adopted by the larger pediatric, and consisting of the application of pressure to the halves of a brass jaw-joint. The second refers to such cases of cure by maintaining the swelling from time to time with a needle, and exciting the subjects' tuberculosis, which, with the assistance of nature, stops the disease altogether. That is to say, in such cases no direct cure.

The infant is usually born with transient erythema of the face, but covered on the head. There is a swelling of the skin on some part of the skull, and through the opening a sac, composed of the dura mater, protrudes, covered only by the integument. The face is heavily marked with such a swelling situated over the vertex of a fetal lobule. The face is intensely anemic, small, pinched, with prominent nose, dilated eyes, the child, holding up the protruding and applying pressure, was tried, and followed up for some time, without the occurrence of any noticeable symptoms. The pinched face was somewhat made worse by the mother's anxiety; yet the child suffered no harm from the swelling, and some general convulsions occurred. At birth, however, sensation of the swelling then alone, was still more increased, and readily such.—(See *Med. Clin. Trans.* vol. 7, p. 427.) *General Remarks*

wild at one, they ought, says Boyer, to extend to white length. "For instance (says he), the simple hairs of the thighs of very young children, are painted spots which I suppose, arise from the upper part of the thigh, to the lower part of the leg. Generally speaking, the longer spots are, the better they fit the limb, and keep the features steady."—(Boyer, *Treatise on Med. Chir.* c. 3, p. 30.)

The tendency of epistaxis depends upon its breadth and the thickness of the flesh. For the former two are sufficient, for the upper and lower lips are often torn; and for the latter two, the nostrils are often torn.

In cases of fractured thighs, when the straight position is preferred, the external splint should extend from the crista of the femur to above the distance between the middle of the foot, while the lateral one should reach from the upper and internal part of the thigh also beyond the sole of the foot. With respect to the lateral splint, it is indifferent whether it only reaches from the crista to the knee, or even to the lower part of the leg.

The lateral splint for a broken leg ought to be sufficiently long to embrace the knee and contain the tendons of the foot and ankle. When the straight position is adopted, a splint is frequently laid more the front of the leg, than the points in the lower part of the limb. Now, however, can ever be applied under the limb, as three the latter itself never permanently affords the necessary degree of support.

Of all the different pieces of the apparatus for the treatment of fractures, the splints are by far the most important and essential. Without them, indeed, it would be in vain to attempt to keep the extremities of the fracture from being displaced.

Splints are generally composed of hard materials, the soft parts of which pressure upon the skin must always be counteracted by placing a sufficient quantity of cotton, wool, cambric, flannel, between them and the limb.

In order to understand, however, the position which should be made the support in the elbow and application of splints, many remarks offered as the article Fractures must be consulted.

SPONGIA PLAZARATA. (*Prepared Sponge.*) *Sponge* (true). Prepared by dipping pieces of sponge in hot sulphuric acid, and squeezing, and pressing them between two iron plates. As soon as cold, the substance thus formed may be cut into pieces of any shape. It was formerly much used in dissecting animal organs, for which it was well adapted, as when the work ended, the elasticity of the sponge made it expand and closed the opening. However, the best modern surgeons seldom employ it.

SPONGIA LINTA. (*Woolly Sponge.*) This medicine, which the preparations of wool are so likely to improve, was often given in the form of lint, as in cases of hemorrhoids, in which particular instances much efficacy was imparted to allowing the lint to adhere gradually under the ligament. Lint-sponge has also been exhibited in many venereal diseases, and in chronic inflammations of the prostate gland. The dose is from a scruple to a drachm.

STAFF. An instrument of considerable importance in the operation of lithotomy, being in fact the key to the prostate or knife. It is made of steel, and its handle is generally rough, in order that it may be more securely held. As it is intended to be introduced through the urethra, its shape ought to be principally determined by the natural course of that passage. The English generally employ a staff, the curvature of which forms the segment of a larger circle than that described by the curvature of a staff used by the French practitioners.—(See *Blasie, Figures, &c.* a *Lithotomie* in 1814, on *Prostate* de la *Chirurgie*, *de Paris*, &c. p. 23.) In other words, the French staff turns more towards that side, as it approaches and enters the bladder. There may be some advantage in this construction, inasmuch as it tends to make the finger enter in the direction of the long axis of the bladder; yet a great deal more must be as to depend upon the position in which the staff is held, than upon its shape. Little doubt should always remain, as Boyer a staff is not to be easily introduced, because the operation will thereby be facilitated. The point, the most important part of the staff, is of course situated upon the convexity of the curved part of the instrument, or upon that portion which, when introduced, lies in the membranous part of the prostatic passage, and the bladder. It should always be made

very broad and concave, as recommended by Langenbeck and Matthews.—(See *Lithotomy*.) The movement of the prostate, at the end of the instrument, should be closed so as to prevent the further entrance of the finger, and prevent the back of the latter instrument from being retracted. English surgeons have been partly misled by Marshall and Schaeffer, for supposing that essential cancer; for certainly the most fatal injury may be done by the point slipping beyond the end of the staff.—(See *Lithotomy*.) But my own part, if I am from such of my countrymen, saying that another, is this, that the back of a proper staff the bladder ought never to pass out of or beyond the os of the urethra.

STAPHYLOMA. (*True staphylo.*) A growth from the being thought to resemble a grape, in that disease of the eyelid, at which the cornea loses its natural transparency, rises above the level of the eye, and even projects beyond the eyelid, in the form of an elevated, whitish, or pearl-colored tumour, which is sometimes smooth, sometimes covered, and according to Scarpa, attended with total loss of sight. However, staphyloma is either partial or total; that is to say, it affects only a part or the whole of the cornea; and in the first case, if there be not too much additional injury of the eye, a degree of vision may yet be left, and great relief of further improvement. The dissections of Scarpa's observations applying only to cases in which the sight is already destroyed, are useful for some important differences between him and other writers, who, in the position which they adopt, refer to the partial staphyloma, and cases in which the sight is not quite extinguished. Scarpa does not mention adhesion of the lids to the diseased cornea, with part of the definition of staphyloma; a point in which he differs both from Marshall and Boyer.—(Compare *Med. Chir. Abridg.* b. 2, p. 63.) However, Scarpa may be correct; for, though, as Mr. Wardrop remarks, "the internal surface of the cornea adheres to the lid in almost every case of staphyloma" (*Lectures on the Affected State of the Eye*, vol. 1, p. 301), for yet it does not invariably do so, the circumstance seems no essential part of the nature of the disease. In some instances, Mr. Wardrop has seen the opacity confined to one half of the cornea, generally the lower one.—(See *ibid.* p. 338.)

Scarpa observes, that staphyloma is often attended by the disease being after death, and mostly in consequence of partial staphyloma. It is also produced by the eyelid, yet never during its progress, nor during any stage of suppuration, but when the patient is dry, and even after the detachment of the vitreous body.

In a great number of subjects, says Scarpa, when staphyloma has attained a certain elevation above the cornea, it becomes stationary, or only increases in disposition to the rest of the eye. In other instances, the essential nature of the cornea enlarges in all its dimensions, and in such a disposition to the rest of the eye, that at length it protrudes considerably beyond the eyelid, in the partial staphyloma and detumescence of the patient.

This disease is justly considered as one of the most serious in which the eyelid is subject; for it entails not only considerable loss of sight, but it occasions, not added to the eye which necessarily results from the bulk and prominence of the staphyloma. In such circumstances, the essential nature of the eyelid to the content of the air and position of water is rendered to it; the friction of the eyelid; the incessant flux of tears down the subjacent cheek; render the eye painful and inflamed; the second eye is affected by sympathy, and the diseased eye at length ulcers, together with the lower eyelid and cheek at which it grows.

According to Richter (*Obs. Chir. fasc. 2*), staphyloma is generally formed without the swelling of the cornea being preceded by any of those morbid dispositions which are usually considered capable of weakening the texture and elasticity of the system; which, in fact, requires a much greater thickness than what is due to its natural state, and consequently staphyloma, far from being common within, is every where common and usual; though it ought to be quite the contrary, if the disease were occasioned, as some yet appears to believe, by an anomalous distension operating on the cornea from within outwards with absorption of its aqueous humor.

Scarpa thinks that Richter has generalized his doctrine too far, by not allowing any line of distinction

operator, that no one will be easily persuaded that the same instrument can ever prove of the least service in determining the size of the staphyloma. Scarpa is, in whole, in error as to, of that which purports to detach the eyelids and rest on the cheek. Under these circumstances, he believes that there is no effectual means of removing the progress of the disease, and removing the difficulty, but waiting away the staphyloma.

Mr. Gussie remembers Scarpa's application of Richter's method to young subjects sometimes, because the thickness of the cornea in them prevents the cause from quickly penetrating the anterior chamber, and considerable inflammation is brought on. (Diseases Surgery of the Eye, p. 115.) It is to be regretted, however, that Scarpa, when he tried Richter's plan, never made use of it to penetrate the anterior chamber, but merely to form and keep up a sort of leech, the exact principle of treatment which Richter himself intended.

Could Scarpa draw two blades of steel, viz. that with a fissure, and the removal of a portion of the cornea and adjoining part of the diseased cornea. (Ibid. p. 115, fig. 7.)

Though, says Scarpa, the first part, or that of the ligament, is at present abandoned, the sagacity of the operator will perceive it is giving a gentle and ligament through the lower part of the staphyloma, and for the purpose of tying or constraining the tumour, it is true, but of removing it, in order to fit the eye comfortably, what the staphyloma is to be cut off is a certain disaster. This use of a needle and ligament, which I observe, is introduced by Mr. Travers (Surgery, &c. p. 285), is strongly disapproved of by Scarpa.

With regard to the second method of removing the staphyloma, or that of excision, Scarpa thinks that sufficient attention has not been paid to the direction of the cut, and that the operation should be done in the centre of the cornea, and that the cut should be as much as half of the staphyloma, and that it should be as wide as a nail in size. As several surgeons of moderate magnitude are mentioned, Scarpa remarks, that the great importance of this precept was fully supported only by those who were when he had occasion to compare the advantages of Collin's doctrine, with the success in consequence of which result from the practice of cutting away the staphyloma directly as he has, and with the pain produced by a second operation, notwithstanding the success, as Wertheimer's history, always followed by acute inflammation of the eyelid and eyelids, violent pain in the head, redness, spasm, copious and extensive purulent discharges of the eye and eyelids.

The patient being seated, Scarpa directs an assistant to support his hand properly; then taking in his hand a knife similar to what is used in the extraction of the cataract, he passes the instrument completely across the staphyloma, at the distance of one line and a half, or two lines, from the cornea, or just of the margin, from the external towards the internal angle of the eye, and, by passing the knife forwards in the same direction, just as is done in the extraction of the cataract, he takes a semicircular incision downwards, in the most prominent part of the tumour. Having done this, he takes hold of the segment of the staphyloma with the forceps, and turning the edge of the knife upwards, he completes the circular incision of the apex of the tumour, in such a way that the detached portion is one line, three, or four lines in diameter, according to the size of the staphyloma. As a portion of the iris adhering to the cornea from the very commencement of the disease is commonly included in this section of the detached part of the tumour, as soon as the circular division of the apex of the staphyloma is made, then the crystalline, or its nucleus, issues from the eye, followed by a portion of the vitreous humour. In consequence of this evacuation, the eyelid is often so distended, that it can be removed by the eyelids, in which Scarpa immediately applies a splint of dry net, supported by a mucous bandage.

When the eye and eyelid seem to be painful, as done, and emit, as they necessarily do in the fourth day, the eye is to be covered with a broad mud-thick poultice. When things proceed in a regular manner, the swelling of the eyelids subsides about the seventh or ninth day, and perfect vision is seen in the position almost with the vitreous humour. The patient

afterward becomes thick and red, the patient feels great pain, and the eyelids are red and thick, and the eye is sore.

At this point, on gently separating the eyelids, the conjunctiva is found swollen, and red, and the pupil of the eye is seen like a whitish circle. This is usually detached on the seventh or eighth day after the operation, when the edge of the surface from which the staphyloma was cut becomes red, inflamed, and very discoloured, so that at last the wound is entirely closed. There is usually in the centre of the cornea, for a few days, a small fleshy prominence, resembling a little reddish papilla, which, after being marked a few times with the argenteo nitratum, continues and lasts.

So far, says Scarpa, the alarming symptoms from following this operation, that in a great number of cases the surgeon is even obliged, several days afterward, to stimulate the eye on which it has been performed, in order to make it inflame, partly by having it a long while uncovered and exposed to the air, partly by rubbing the circular incision made in the centre of the staphyloma, of which another circular portion half a line broad is removed, in order to facilitate the more abundant discharge of the humours, and the ingress of air into the interior of the eye, which now is backward and inflamed. As soon as inflammation has reached the interior of the eye, and suppuration has taken place, the rest of the cure regularly follows under the use of topical emollients, and is soon completed with all possible alacrity.

It should be particularly recollected, that Scarpa means the foregoing plan for indolent cases of staphyloma, where the growth is fairly lost, and the progress of the disease beyond position, or even emollient. Under other circumstances it is not advisable. Among others, Dr. Verch particularly objects to the removal of the apex of the tumour, as a destruction of all chance of the recovery of a degree of vision; a consideration, however, which would not exist in the highest stage produced by Scarpa. Dr. Verch also disapproves of letting out the vitreous humour in cases of staphyloma, as an endless source from which no permanent effect takes place, the liquor collecting again in a few days; a sentiment which is likewise expressed by Mr. Travers. (See *Verch on the Diseases of the Eye*, p. 121) and Dr. Travers, *Surgery*, &c. p. 285.) For the purpose of accomplishing the gradual diminution of the tumour, and bringing the eye into a state in which an artificial prosthesis may be used, Dr. Verch has employed another method recommended both by Richter and Beer, and the introduction of a string through the tumour. Beer confirms the statement of Scarpa, concerning the impossibility of removing the transparency of any part of the cornea affected with staphyloma. For the relief of a partial staphyloma, he makes the following application of the compressed air of Anthony, by means of the point of a needle-like brush, while the eyelid is well held asunder. The diseased part of the cornea is to be separated with a small sharp superficial scratch is formed, when every particle of the cornea may be immediately washed out of the eye with another large camel-hair brush dipped in water or milk. The operation is not to be repeated, until the subsequent inflammation has quite subsided, and the staphyloma removed. Beer continues all medicinal values, because their influence is to be put to rest which should be left undisturbed. (See *Verch on the Diseases*, &c. p. 121.) Mr. Gussie regards the treatment with caustic as only applicable to cases in which the eyelids, where the diseased tumour is thin, and the vitreous fluid is quite healthy. The knife, he says, is suitable in young or old individuals, where the staphyloma is entirely thick and hard, and the first of the eye been at least removed. (See *Verch on the Diseases of the Eye*, p. 121.) In the last resolution, indicated by the thick, indolent appearance of the sclerotic, which seems to be protruded close to the cornea by many narrow dilated vessels, and accompanied by a more advanced stage by a further out of possible pain in the inner chamber, leaving the vitreous portion of the eye might be removed, and with it the tumour, which may be a curious case. (P. 121.)

Went and success is often achieved by staphyloma, a protrusion of a piece of the iris through a wound in the eye. (See *Verch on the Diseases*, &c. p. 121.)

Dr. P. D. Hunter, *On Staphyloma*, Twining, 1788.

and generally trace the changes which take place by slow but sensible degrees in the nature of the secretion, from mucus to pus, and from pus back again to the state of mucus. This gradual discharge from various membranes in a case of inflammation may be kept up for months without those membranes appearing to undergo any other material change than a slight degree of redness and swelling. A low subsidence of activity is found not to happen earlier than a more time out of our examples of suppuration from mucous membranes.—(On Inflammation, p. 305, 306.)

The same well-informed writer afterwards proceeds to explain, that suppuration may be really produced in the case of catarrhs of the bladder, by whatever causes inflammation is that feature, and causes a separation of the catarrh. We have examples of this fact in bladders from catarrhs, and in vesiculations of the cuticle from superficial burns. In the vesicle covering a mucous blister as this be removed, and the catarrh exposed to the irritation of stimulating substances, pus will soon be discharged from the abraded surface. Suppuration can be kept up in cutaneous blisters for an indefinite length of time, as we see done every day in the management of pyæmic blisters. Ulceration is seldom observed in these cases; and, consequently, in cutaneous blisters, loss of substance is by no means necessary for the producing of pus.

If the cuticle be divided, as in a wound, or a portion of it removed, as in the excision of tumours, and either the air or any other external body be permitted to remain in contact with the divided surface, the process of suppuration is speedily induced in the cellular texture adjacent to the skin. After the hemorrhage which takes place from the small vessels has ceased, as coming of a fluid, at first coagulating serum, occurs, which is gradually changed into pus. But in this case, as Mr. Thomson has correctly observed, the surface of the wound is previously covered with a layer of coagulable lymph, which is penetrated with blood-vessels, and gradually mixed into the little red substance termed granulation.

Appositions similar, though slighter in degree, says Dr. Thomson, are observed in cutaneous suppuration; giving occasion to the eruptions of Sir E. Home, that in inflammation a vascular surface is produced previously to the formation of pus in a cellular membrane, and perhaps also in cutaneous texture. Dr. Thomson is inclined to believe, however, that no new vascular surface is generated in the inflammation of mucous membranes. Thus we see, that in the formation of pus in various membranes, cutaneous texture, and exposed cellular substance, no difference, no breach of substance occurs; but that, on the contrary, in two of these textures, the cutaneous and cellular, there is an addition made to the parts by the gradation of coagulable lymph, which becomes organized.—(Thomson, p. 325–326.)

SYMPTOMS OF SUPPURATION.

When matter is fully formed in a tumour, there is a remission of all the symptoms. The throbbing pain, which was before frequent, now goes off; and the pulsatile, erythematous, or more dull, constant, heavy pain. A critical subsidence, or paroxysm, as it is termed, takes place at some part of the tumour, generally near its middle. In this situation, a whitish or yellowish appearance is generally observable, instead of a deep red, which was previously observed; and in dissection of a fluid underneath may be discovered, on it a small elevation with the finger. Sometimes, indeed, when an abscess is thickly covered with scales and other parts, the dissection cannot be easily distinguished, though, from other surrounding circumstances, hardly a doubt can be entertained of there being even a very considerable collection of matter. An extraordinary swelling over the situation of deeply situated abscesses is a symptom which often occurs, and is well worthy the attention of every practical surgeon.

The discovery of the existence of deep abscesses is a circumstance of the highest importance in practice; and one which greatly interests the practitioner's pecuniary. In no part of surgery experience is more, similar cases of gravest error to him than in the present; and however simple it may appear, yet nothing, it is certain, more readily distinguishes a naïve from a skilful and extensive practitioner, than his being able early to detect collection of deep-seated matter. On the

contrary, setting off materially injures the character and prophylactic effect of a surgeon, as his having in such cases given an inaccurate or untrue prognosis; for generally, in evidence of this kind, the nature and extent of the case are at last clearly demonstrated to all concerned.

Together with the several local symptoms of the presence of pus already mentioned, may be considered the frequent shiverings to which patients are liable, especially in the first formation of acute abscesses. However, these signs are uncommon so as to be accurately observed, unless the collection of matter be considerable, or situated internally in some of the viscera.

In the progress of the fever accompanying acute inflammation (says Professor Thomson), rigors or cold shiverings not unfrequently take place, which recur at irregular intervals, and are in general followed by a hot fit, and slight increase of the febrile symptoms. These rigors or cold shiverings are general, systemic, when they occur in the progress of inflammatory diseases, and pus either is formed, or is about to be so, for inflammation according to injuries of the head, these rigors are often the first constitutional symptoms which give alarm to the unskilful practitioner. For they are generally, though not always, an indication that inflammation has already made a difference in our final progress. These rigors also accompany the formation of pus in the viscera contained within the cavity of the chest and belly; and are when the first symptoms which inform the practitioner that his endeavours to procure resolution have not been successful.—(See Thomson's Lectures on Inflammation, p. 320.)

Rigors, as Mr. Hunter remarks, are more common in the commencement of spontaneous lading systems, than in inflammations from external injury. They seldom occur in the suppurations which follow operations.

According to Sir A. Cooper, when matter is formed upon the natural surface of the body which are connected with vital organs, such irritation and disturbance take place; but when matter is produced upon the surface of a wound is a point not important to life, or upon parts of little vital importance, then its formation is often superseded by irritative fever.—(See Lectures, &c. vol. 2, p. 113.)

The constitutional symptoms which attend the formation of pus in the progress of chronic suppurations, are generally comprehended under the name of hectic fever.—(See Hunter.)

The pain attending what Mr. Hunter termed suppurative inflammation, is increased at the time when the vessels are dried, and this gives the sensation called throbbing, at which every one can easily be made sensible, by merely paying attention to the inflamed part. Perhaps this last symptom is one of the best characteristics of this species of inflammation. When the inflammation is arising from the inflamed state of the suppurative, the pain is considerably increased; but when suppuration has taken place, the pain is more degree subsides.

The pulsation then took place in the adhesion stage is now increased, and is of a pale scarlet colour. The pain when it was free, hard, and confined in the previous stage of the inflammation, now becomes still more enlivened, in consequence of the greater distention of the vessels, and the greater quantity of coagulable lymph thrown out.—(Hunter.)

THE END OF SUPPURATION.

The discharge of the living matter of an abscess into pus, and the power of this fluid in causing the dissolution, are opinions which are no longer maintained by any well-informed surgeons of the present day; and the use of such terms as "pus corrodes," "it is said," &c. expressions which imply an erroneous way of thinking, is very properly almost entirely discontinued in the language of every sensible medical man. If these notions were true, no one which a dissolving matter could be supposed from a continued dissolution. Such ideas probably arose from the circumstance of an abscess being a hollow cavity in the solids, and from the supposition that the whole of the original substance of that cavity was very the matter which was found in it. This was a very natural way of accounting for the formation of pus by

The dead parts separate, leave internal surfaces exposed.—(Haller.)

As every injury, or effect of outward violence under the skin, or external action, is more or less impeded in its surrounding air, the expansion of air in internal suppuration has been supposed, as a cause of suppuration, but certainly this is not the least effect of air, as pointed out above, for a suppuration would not form a wound, were it even contained in a cavity, by circumstances altogether, the air cannot possibly get to the parts, so as to have any share in raising these suppurations.

In most of suppurations, when the air is diffused over the whole body, the suppuration is the commonest lesion, as exposure or imperfect of some internal surface should be made, for the purpose of allowing the air to escape. A stronger proof that it is just an admission of air which makes parts inflame is that the cells in the soft parts of blood, and many of the cells and canals of their bodies, communicating with the large, and always containing air, never inflame, but as these cells are exposed in an internal ulcer, the stimulus of suppuration is given, then various these inflame, and their surfaces either form abscesses together, or produce pus.—(Haller.)

When the interior of an abscess is examined, the cavity which contained the matter is observed to be lined with a smooth, pearly-like substance, which is of a white, anhydrous, and has a strong odour, where it communicates with the atmosphere. This membrane-like formation has been termed the *pus* or *pus* of the abscess. It seems to possess the same as that of the abscess, to be the surrounding cellular membrane, which is itself likewise dense in texture, and more vascular than in the natural state. (Thomson's Lectures, p. 319, 320.) As this being closed by coagulating lymph, effused is consequent of that species of inflammation which Mr. Haller termed the adhesive. Thus, by the formation of a cyst, and the effusion of coagulating lymph in the cellular membrane around the abscess, the collection of matter is bounded and cannot become diffused, as it otherwise would do in the communicating cavity of the cellular membrane, like the case in suppuration.

Therefore like this diffusion of pus seems to occur in suppuration phlegmonous. But in this case (says Professor Thomson), the vitality of pus is lost, the position of the cellular membrane is destroyed; the dead and pus are converted into dry, white, anhydrous, and odourless substance; and it becomes extremely difficult to say whether any part of the pus contained in the destroyed cellular membrane has been formed in the cells in which it is contained, or has been absorbed into these cells, after being separated from the pores of the cellular membrane, the abscess themselves.—(Lectures, &c. p. 320.)

There can be no doubt that, after an abscess has received its suppuration, either at cyst, the secretion of pus is continued from the surface of the latter part vitally, as well as whatever degree of absorption of the same fluid happens to be going on. In fact, the cyst must be both secreting and absorbing surface. The circumstances which lead to the loss of this power, are the frequent rupture, or gradual removal of very large abscesses, collection of matter; the purulent changes occurring in the quantity and composition of the pus; and the speedy filling of the cavity with purulent matter again after the first contents of the abscess have been discharged.

Another thing which is yet a subject of controversy is, whether suppuration ever happens, unprovoked by inflammation? Professor Thomson, of Edinburgh, believes, that the stimulus operates on this point was first suggested by De Haen, of Vienna, but he thinks that much of the uncertainty of sentiment is the better part provided from the vague "action, continued and continued to the suppuration which necessarily characterizes the state of inflammation, and also with regard to the properties by which pus is to be distinguished from other internal fluids. Accordingly, in answer to the examples which De Haen has adduced to prove the formation of pus, without the previous existence of inflammation, he has himself occasion to remark the equality of coagulating lymph, and the mixture of purulent adhesions, phenomena, which are now known are produced by that state which Mr. Haller has denominated adhesive inflammation." But Dr.

Haller uses the term inflammation to express that state which we denominated suppuration or suppuration abscess; but in speaking of the cause of suppuration which he has adduced, he observes, that "it is many of them, no previous loss in consumption of substance could be perceived." An observation similar to this was made about the same time, or perhaps a little earlier, by Dr. W. Hunter, and is almost given of it in the second vol. of the London Medical Observations and Inquiries.

Mr. Hunter, though he endeavours to establish it as an ascertainable fact, that an suppuration takes place which is not preceded by inflammation, is of opinion, that collections of what he terms serous matter, resembling the pus, may form in various parts of the body without the previous existence of inflammation in the parts in which it is formed, and accordingly you will find, at page 200 of his Treatise on Inflammation, a chapter entitled "Of Collections of Matter without Inflammation."

Professor Thomson doubts, however, whether these collections of matter, said to be formed without inflammation, would not have been more properly denominated serous abscesses or chronic suppurations. I am disposed to believe (says he), that in whatever texture or organ of the body serous abscesses form, these inflammations will be found to exist. The phenomena, it is true, of inflammation, both local and constitutional, are modified by the existence of the serous abscess; but they are, I believe, always present in such a degree as to justify us in giving to them the name of inflammation, and in classing most, if not all local serous abscesses, among inflammatory diseases. When the violent swelling, of which Mr. Hunter speaks, occur near to the surface of the body, that part feels warmer than usual, every part in white swellings of the joints. The swelling also is either preceded or accompanied with some degree of pain, though, when the abscess is internal, the patient may not always be very acutely troubled by the present state of the part. When we take the parts also affected with serous swellings, we may say that they are vascular, that is, that all the symptoms occur by which the state of inflammation is characterized.—(On inflammation, p. 313, 314.) In another place Mr. Thomson admits, that the matter which is formed in chronic suppurations does not always necessarily resemble that which is formed in acute abscesses, yet he contends, that it does resemble both in its physical and chemical characters, as well as in the circumstances in which it is produced, that he can see no reason why it should not be called pus or a puriform fluid.—(p. 315.) For A. Cooper also indicates the serous doctrine, that the formation of matter is preceded by inflammation, which, he says, is healthy process is active, while in the debilitated and suppuration, it is often very slight, and the pus produced generally less perfect.

Sometimes there is even such a change of action that the pus is slowly diffused, being in serous abscesses serous and curd like, or even thick.—(Lectures, &c. vol. 1, p. 120.)

QUALITIES OF PUS.

True pus has certain properties, which, when taken singly, may belong to other sections, but which, collectively, form the peculiar character of this fluid, viz. globules swimming in a fluid which is coagulable by a solution of the acetate of ammonia, which on some occasions separates in, and, at the same time, a coagulum of inflammation. This fluid, like serum, is coagulable by heat. Pus also contains abundance of albumen; it never is poured upon pus until one solid part, which remains in the bottom of the vessel, be entirely deprived of all serum and globules, numerous portions of white are found remaining, and although not exactly of the same size, yet they have a great resemblance to pusules. They are composed of serum, fibrin, and globules; and were for A. Cooper. I have in human a theory upon this subject; I should say that pus was composed of the constituent parts of the blood, slightly changed in their character by inflammation.—(Lectures, vol. 1, p. 121.)

The colour and the consistence of pus are the two qualities which first attract the notice of every the most superficial observer. The colour differs from the light colour of this fluid being changed of very

small round bodies, each containing the globules of cream. The fluid in which the globules of pus swim, when first it is supposed to be the exudate of the blood, is a compound with just like the latter fluid. Pus is now possibly mixed with a small quantity of fibrinous (fibrin), as it partly dissolves after it is formed. However, the fluid part of pus is said to have properties which render it so. These being a weakly fermentous pus and milk, experimenters have been unable to ascertain whether the fluid of pus could be separated from the granular part of it, and had no coagulable matter effected in this manner; a solution of murexide of ammonia made the fluid part of pus coagulate, but not any more ignominious of material fluid; and hence it was concluded, that whenever globules were found remaining in a fluid coagulable by means of ammonia, the matter was to be considered as pus.

The properties which the white globules have to the other parts of pus, depends on the health of the parts producing the discharge. When the globules are very abundant, the matter is thick and white, and is called healthy pus; the secretion of which is, that the body which produced it is in good health; for those operations in the matter are so more than the usual of a healthy salivary processes going on in the solids, the effect of which processes is to produce the disposition on which both suppuration and granulation depend.—(Huxley.)

Pus is specifically heavier than water, and is probably about as heavy as blood.

Besides the above properties, pus has a sweetish, earthy taste, very different from that of most other secretions; and the same taste takes place, whether it is pus from a sore, or an irritative inflamed surface.

Pus has a weak in some degree peculiar smell; but this differs in different cases. Some diseases, it is said, may be known by the smell, as, for instance, a gonorrhoea.

Pus is in water; hence float. The commentators to water a suddenly troubled while, colour, induces gives the appearance of stringy portions floating in it. Mucous is said to be more rapidly dissolved by, agitated and then put in. It has also been asserted, that if water be added to such solution, the pus is precipitated to the bottom of the vessel; while the mucus, instead of being completely precipitated, forms a scum-like float.—A solution of murexide of ammonia dissolves both pus and mucus; but when water is added, pus is said to become separated, but not so true.

Though writers on chemical matters and precipitations have been thought of, but of the distinction between these two fluids, yet the simplest has been thought about and explained. It has been concluded that all animal substances, whatever, when in solution either in acids or alkalies, would be in the same order, and, therefore, that the precipitates would be the same in all. Calcareous earth, when dissolved in murexide acid, is in that acid, in the same state, whether it has been dissolved from chalk, limestone, marble, or calcareous bone; and precipitates from all are the same. Hence, the experiments have made its results almost certain, such as strychnine, carbon, carbon, iron, &c., and of (suspensions), such as suspended in water of an egg. All these substances were dissolved in sulphuric acid, and precipitated with potash. Each precipitate was examined with such care as to be fully cleared of the forms of the precipitates, all which appeared to be fully independent. The precipitates of strychnine had exactly the same appearance. The same experiments were made, when the above kinds of animal matter were dissolved by caustic potash, and precipitated with the murexide acid. A fleshy substance, such as the pig's bladder, composed of various ingredients.—(Huxley.) For additional details refer to the work of pus, and an account of those experiments by Dr. Thomas and Greenough, see the first volume of the Practice of Surgery, last edition.

Does not irritate the particular surface which produces it, though it may be very irritating to another. Hence, no suppurating surface of any species, and can be kept up by its own matter: if the fluid was kept in the case, no use of a specific quality, or producing matter of an irritating kind, could ever have been needed. This is similar to every other secretion of stimulating fluids, as the bile, tears, &c. when fluids do not stimulate their own glands to form, but are

capable of stimulating any other part of the body.—(Huxley.)

Whenever a cold disease attacks either the suppurating surface, or the constitution, the production of pus, pus comes, and the fluid becomes changed in some measure, in proportion to these medical circumstances. In general, it becomes thick, thicker, and more coagulable, and purulent parts of the matter of the blood, as in the case of many other secretions, under similar circumstances. Hence, in this form usually appears to improve to put in the degenerated blood. The healthy part of matter has more of the blood, and the quality of the coagulable part is improved by a solution of murexide of ammonia. It has also a great proportion of the albuminous parts of the blood, which are soluble in water, such as milk, and it has a great tendency then to be put in, becomes putrid. Such a healthy matter may even be irritating to the surface which produces it.

The secretion of matter is often supposed to be long, while the constitution is thus disturbed, a case will frequently appear almost dried up; but in the production of the blood, its surface will change some part in some disease. This is a fact which every young doctor must have noticed. A smaller check to the secretion of pus is also produced when a sore, or the parts immediately around it, are attacked by fresh inflammation. The diminished quantity of pus is likewise changed in its quality, so it becomes a thin fluid, or a thin fluid, composed of serum and red particles.—(See A. Cooper's Lectures, p. 122, vol. 1.)

The discharge, when of an irritating kind, is more stimulating to the suppurating parts with which it comes in contact, than to its own secreting surface. In the manner it frequently produces extension of the skin, and ulceration. Thus the tissue promotes the only in the thick, in consequence of the pressure of cells which they contain. From this effect, water has been used to compress, equally which it does not; the more pliable which it possesses being that of retaining the parts which it touches so as to cause their absorption.—(Huxley.)

When the vessels have lost the power of producing good pus, they also lose much or both the power of emitting granulations. This may depend on their distance from the diseased surface, and hence when with vessels should possess, in order to be qualified to the performance of these two operations.

Thus, from several considerations, would appear to be general to have a greater tendency to production than the natural juices have; but, perhaps, this is not the case with pure pus, which, when first disengaged from an abscess, is commonly perfectly pure. There are, however, some exceptions to this; for thus depend on circumstances entirely foreign to the nature of pus itself. Thus, if the abscess has had communication with the air while the matter is contained in it, or if the collection has been so near the surface of the skin, as to have been infected by the frost, but we cannot wonder that the matter should become putrid. When blood is mixed with pus, when clots are found with it, when the parts forming the seat of the pus are in a gangrenous state, from an inflammation, when the matter has a great tendency to putrefy, then the pure pus disengaged from such abscesses is highly impure. Pure matter, though slowly formed, is capable of change by extraneous addition, it is mixed with a variety of matters and impurities. It is more susceptible, than we find it is putrid, as it is more for weeks, without having undergone any putrefaction. These qualities, however, only being in pus, put, if a healthy one, however, the matter will become from it, though combined with extraneous blood or dead white, because such matter putrid, and much more irritating than the discharge formed from the abscess of the ulcer.—(Huxley.)

In the preceding paragraph it is stated, that matter frequently remains unchanged in its nature for years. This statement of Huxley's is not exactly correct; for it is well known, that the surface of the cavity of abscesses are always changing, as well as the matter; consequently, there must be a continual renewal and change in the contained matter.

When there are diseased bones, or other extraneous bodies, exciting irritation, sometimes even to a great degree as to make the vessels bleed, and when blood

them, this matter is always found to be very offensive. This state of the discharge is very much of a diseased look.

The discharges of an unhealthy sore blacken silver probes and preparations of lead. This effect is noticed, by Dr. Crispin, in the sulphuretted hydrogen gas generated in the matter.—(*Phil. Trans.* vol. 51, ser. 1, 1796, p. 263.) Further interesting observations on the nature of pus may be found in an Essay on the Difference between Flegm and Pus, by Dr. Boerhaave, also in Dr. G. Fournier's Paper in *Philos. Trans.* 1811.

USE OF PUS.

By some it is supposed to carry off humors from the constitution. Suppuration is sometimes regarded as a constitutional disease changed into a local one, which constitutional disease is discharged, or thrown out of the body, either in the form of pus or together with this fluid. Critical diseases have been thought to be cases of this sort. Suppuration has also been imagined to carry off local contagions from other parts of the body, or the local principle of derivation or resolution. For this reason some surgeons are often made to repeat parts before other ones are done up. Suppuration is sometimes excited with a view of making parts, such as indurated swellings, absorbent and putrid; but I have observed to absorb and to disengage the solids is concerned in the production of pus.

A secretion of pus is looked upon as a general protection of nature to all the cutaneous diseases. Hence, nature will make us keep off suppuration as well as local diseases. However, the use of pus is perhaps unknown, for it is found most profusely from healthy sores, and in healthy constitutions; and large discharges from parts not very essential to life produce very little change in the constitution, and so little upon being healed up, whatever secondary support to the system.—(*Hastie*.)

This is certainly the case with many old ulcers, the suppuration from which seems to have little or no effect in improving the health. Now in these few rare cases to be afraid of healing such ulcers, when possible, for a worse disease should follow from the stoppage of a discharge to which the system is supposed to be so habituated that the continuance of it must be essential to health.

Every one knows that when there is no interference at all, that is, when the surface of a sore is left uncovered, the thin part of the matter evaporates, and the thick part dries and forms a scab. Nature, therefore, seems to have designed, that use of pus should be to make a cover, or protection for diseased surfaces. But I cannot agree with what has been asserted (*Hastie*), that the natural healing of a sore under a scab takes place more quickly than when surgical dressings are employed.

On ulcers, it would appear from modern physiological observations, "the coagulated pus is rendered soluble by the saturation of its carbonic acid, and these (pus, or serum, are immediately filled with red blood, and thus connected with the circulation." If this point were established, the lowered blood economy, that these would then be able to diffuse is making out the suppurating stages, by means of which the coagulated pus afterward becomes organized.—(*On the Generation of Pus, in Crustaceous and in Fish, in Phil. Trans.* vol. 60, p. 262, Lond. 1812.) These observations are curious, and ought to have been noticed in the source of pus, to which they were immediately added. I do not imagine, however, that nature will in nature send further the secrets here referred to.

Among the secondary uses of suppuration may be mentioned, opening a communication between a disease and the external surface of the body, forming a passage for the exit of extraneous bodies, &c.

TREATMENT WHEN SUPPURATION MUST TAKE PLACE.

In cases of inflammation, arising from accident, but so circumscribed that we know suppuration cannot be prevented, the indication is to moderate the inflammation, which, if the powers are great, and the injury done constitution, will probably be very violent. If the constitution should also be much affected, certain general means are proper, such as bleeding, purging, and assuaging remedies. While the constitution is

severely disturbed, suppuration cannot take place in the most favorable manner. In these cases, then, such medicines as produce a gentle perspiration greatly relieve the patient; for instance, the pain, *peran. comp.*, *mentha. p.*, *pepp.*, *mentha. p.*, *mentha. p.*, &c. Opium may produce a temporary dissipation of action; but they do not always have this desirable effect, and in some constitutions they increase the general irritation of the system, and seriously aggravate the inflamed matter.

The applications to inflammations which are leucopurulent and form an abscess commonly need not, postures and compressions. These, however, appear to be applied without much critical success in dissipation; for they are applied before suppuration has taken place, and when this system is not done up, and they are also applied after suppuration has taken place. With respect to suppuration itself, abstracted from all other considerations, the indication cannot be the same in every case; but if postures and compressions are found to be of local service in the two stages of the disease, there must be observing, constant to both for which they are of service, independently of simple suppuration. Postures are useful when the inflammation attacks the skin, either in the first instance, or after an abscess has approached so near the skin that it becomes secondarily affected. This benefit appears to arise from the skin being kept soft and moist. Such is the use of a posture in inflammation, either before or after suppuration, until the abscess is opened. But when postures and compressions are applied to inflamed parts, in which we wish to avoid suppuration, reason and principle will not justify the practice, though such applications may be preluded by experience to be very proper.—(*Hastie*.)

TREATMENT AFTER SUPPURATION HAS TAKEN PLACE.

When suppuration cannot be stopped or removed, it is in general to be protected.

How far suppuration can be safely prevented by medicines or applications is questionable, but it is generally possible, and for this purpose supporting cataplasms and blisters, composed of the warm gases, acids, &c. were formerly much recommended. Mr. Haastie doubts whether such applications had any considerable effect in the way intended; for if they were given a time, they would hardly increase the discharge from it, and perhaps even diminish it. However, in many cases in which the pus is not evident and hardly admit of the inflammation, in consequence of which a perfect suppuration cannot take place, stimulating the skin brings on a more salutary, and, of course, a quicker inflammation. Thus the antiseptic treatment and blocking the skin over chronic swellings and abscesses, are sometimes indicated.

These applications have been found, however, to bring the matter more quickly to the skin, than in the most rapid suppurations. This effect has been mistaken for an increased formation of pus; but this consequence can only follow in cases in which the lower surface of the abscess is within the influence of the skin. The accelerated progress of the matter to the surface of the body arises from another cause, viz. the promotion of absorption to the part, because the collection of matter and the cure.

Essential postures are commonly applied to inflamed parts, when suppuration is known to have taken place. These can have no effect upon suppuration, except that of lessening the inflammation, or rather, making the skin more dry. The inflammation must have reached the skin before postures can have much effect, for they can only affect that part. The use of the patient, however, should be considered, and we find that compressions and postures are often beneficial in this way. By keeping the article about the wound, the sensitive operations of the parts of the part are worked. On the contrary, if the inflamed skin is allowed to dry, the inflammation is subdued; and as suppuration is probably prevented by the above treatment, it ought to be put in practice. As usually excepted, unless the suppuration should be so severe as the patient can bear without inconvenience.—(*Hastie*.)

The local treatment in phlegmonous abscesses (as Professor Thomson observes) is still more simple than that by which we endeavour to prevent resolution. It

her and the skin at this part is the venous region against the jawed. If an abscess is rather recently formed, and points in a place which is kinder than where the radiation lies, it is proper to make the opening where the cervical sinus is, as the point, for pointing, appears. Thus, if an abscess should form in the tissue of the human jaw and point in the upper part, which is often the case, it would be improper to cut through the lower half of the maxilla, in order to render a passage for the matter in that direction. If an abscess should form on the upper part of the face, it would be wrong to make an opening through the side of the face to get at the most dependent part of the abscess; the better thing would be a depth of several parts, a great many small ones would be destroyed.

Where the choice does not point to a separating situation, as in the instance just cited, since the point where the matter threatens to open a passage is likely to be the future opening, and this situation is deemed inadvisable to the feeling of the deep part of the subject, it is generally best to let the collection of matter first burst off itself, and then allow the opening actively to recover. By allowing otherwise to burst spontaneously, the opening is not so open to him as if made by an act, and, therefore, is better in such situations—*(Myer.)*

In most cases, it is queer, advantageous even to call through a certain thickness of paper, by the aid of drawing a depending spring, then to make an opening where the pointing appears, that is, where the point is thickest, and the writer restored the surface. This remark is highly worthy of remembrance, when there is to be done the thickness of matter at the depending place, and when the parts to be divided are not important ones. Collections of water beneath the folds of the forehead and high particularly drawn attention to this disease, as they constantly point where these operations are possible are thickest, not where the matter can be readily escape.

Abstinence is the element of the positive abstinence should also be spread in a large situation.

SUFFICIENT NUMBER OF OPENED ARCHIVES.

All Muslims will naturally have of this—why, because the justice is obvious, and in general, they would be allowed to take this station. There are, however, as I have already explained, particular circumstances which require to be fully ascertained; but, with the skin and the station is very thin, it is not of great consequence whether the cause be permitted to stand or not, if it is opposed by the majority.

When there are any larvae, it is perfectly necessary to open them by air, whether they have been discovered or not, for the natural opening will seldom be sufficient for the maturation of a worm, and although some is sufficient for the free discharge of the matter, yet these worms will lead a more miserably tedious life, spending it in doing for the thin skin over the cavity of the pharynx, and, therefore, without sympathy with the parts underneath. (Mason.)

Attenborough will be surprised either by an increase, or by a lack of an upsurge with climate. "In the latter phase, however, many very young organisms—the sort of animals that I just briefly alluded to with my adaptations when they are first formed by a single neuron—upon a further increased partial gress must enter part. It is more like in a little, and the organism can never forget the importance of the critical, so accurately as to destroy exactly the parts which he wishes, and not more. It is the entire he can't keep deep enough, the lower part, after all, is gone. Critical, also, however, after its application, a distinguishable state, a combination of some importance in keeping answers about the critical level in fact. To these young organisms we have to add that the signal is very frequently seen or is clear, indicate days in a season, delivered.

While there is a redundancy of skin, at times there is a good deal of it thrown, however, absorbing up to with cosmetic will manage, perhaps, as well as an incision. The application of cosmetic only also sometimes be advantageously resorted to when there is a good deal of broken tissue around a small ulcer.

The side view pattern, or the pattern alone, is the first pattern for making the skirt. The pattern is first to be drawn with a piece of muslin paper, which has a portion cut out under the curve of the same figure and size as the opening intended to be made in the muslin.

The first step of making the ocker is to dip the end of the capsule in water, and to rub it on the part of the skin to be treated. The dried substance is then to be repeatedly washed off with warm water, the plaster is to be removed, and an ocherous pellicle appears.

In almost all cases, it is better to use the insert, or double-weight blanking. Either of these instruments opens the abdomen to view, and with less pain than results from the use of craniocly; it necessitates no loss of substance, consequently a smaller cicatrix; and by using it the opening may be made in the most advantageous direction, and of the exact size required.

DECLASSIFIED AUTHORITY: 48 CFR 1.101-2.6

When an alcohol has been of itself, and it is time necessary to change the ageing, the only thing responsible is to keep the outstanding parts clean. The neutralization of the same kind of positive which was necessary used is, perhaps, as good a practice as any; and when the treatment, nothing from the fermentation is over, and a product may be made that of, instead of the

For an address opened by a cutting instrument is both a wound and a cure, and portends some of the nature of a fresh wound as prescribed to the thickness of the point of it. Hence, it is necessary that something should be put into the opening to keep it from healing by the first intention. If it is hot, it should be stopped by a compressive, which will remove better than that alone, as it will inhibit of being taken out again. This is accomplished, by some such means should be dressed the next day, or, at least, on the second day, in order that the life may be discharged safely. When the end of the opening has perforated, which will be in a few days, the tissue dressing may be as simple as possible, for nature will in general complete the cure.

If the discolor has been repeated with caution, and the slough-like surface were cut out or separated if thick, the wire can be reprinted satisfactorily as a photographing copy, and fixed immediately.

[illegible][illegible]

more can be expected from such a mode of study than mere imitation, or blind experience. Indeed, some people have affected to oppose surgery as an art, to medicine as a science; and if these professions were fairly founded, the former would certainly be regarded as a more mechanical occupation. But it is not very easy to comprehend the grounds of such a distinction. The internal and external parts of the body are governed by the same general laws during a violent attack, and if an internal part be attacked with inflammation, the symptoms and effects will bear a great similarity to the same disease situated externally; nor are the individuals of one sex, in general, materially different. If he observe, therefore, he acquires a knowledge of the laws of nature; he knows what is known of the state and mode of nature. In the production, progress, and termination of surgery it therefore results as easily the title of a scientific practitioner as the uneducated physician. The practical parts of physics and surgery are very differently classified; but their theory and principles are indivisible, since they truly constitute one and the same science. — (*Principles of Surgery, Preface.*)

As a second Professor lectures, the flag is between physics and surgery are not very precisely separated, and he expresses his opinion of the physician and surgeon, saying in those words have existed, are just but very imperfectly defined. "The most essential acquaintance with the symptoms, progress, and termination of the various internal affections to which the human body is liable, must be sufficient to convince every student of medicine, that there is but a slight dissimilarity, if indeed there be any, for this distinction in the nature of the disease which these practitioners are required to treat, or in the medical treatment by which the disease themselves may be cured or relieved. Experience has long shown that the most internal morbidities are not only required in a large proportion of the diseases which are regarded as merely surgical, but also, that there are few diseases which fall under the care of the physician, in which medical affections, requiring the talent and practical skill of the surgeon, do not frequently occur."

The treatment of febrile and internal inflammatory diseases, it will be observed, belongs exclusively to the province of the physician, whereas the distinction between physician and surgeon has been introduced, and is strictly observed; yet, in some species of fevers, and in all febrile inflammatory diseases, blood letting is often the principle, if not the only remedy that is required. But this is an operation, however urgent the necessity for it be, which does not engage the physician's hands, and from the line of separating the province of the profession will not perform. Retention of urine not infrequently takes place in dyspepsia, febrile diseases, and even in an affection which does not always point to the use of external remedies; but such an affection also, from the painful symptoms which it frequently excites, as well as from the danger which it sometimes, that will not admit of delay. When internal remedies, therefore, fail in relieving the patient, the urine must be speedily opened off by means of a surgical operation; otherwise inflammatory, morbidities, and rupture of the bladder may necessarily ensue. Febrile and internal inflammatory affections therefore not infrequently in the formation of fluids, which it is necessary to cut by a surgical operation; and otherwise, venous stagnation, and there are fevers, which require the aid of the surgeon. In gonorrhoea, which is attended with severe febrile diseases, from being long shut down to their beds is one position, some of the parts of the body, then, which they rest, occasionally require a division to mortify, deeper or shallower portions of the soft and subjacent cellular membrane, breaking dead, separate from the living parts, and move the fluids which are but too often the subject of unavailing surgical practice. To surgery in the different stages of the species of mortification, from its first commencement to the complete separation of the dead parts, and the formation of a new skin, the appropriate external and internal remedies, require a proper share of surgical skill, if this can reasonably be expected in those who assume a profession solely of physic. Unhappy, therefore, must be the lot of that student, who in circumstances similar to those which I have mentioned, has the misfortune to have for his sole medical attendant a physician ignorant of surgery.

"But (says our Professor Thomson) if a knowledge of surgery is necessary to the student who intends to practice physic, the knowledge of physic, on the other hand, is equally necessary to him who intends to devote his attention exclusively to the profession of surgery. For, indeed, there are some dangerous diseases, which are not, in some period or another of their progress, unaccompanied by morbid affections of the same nature with those which fall properly, and most frequently, under the care of the physician. It will only be necessary to mention, as examples of these affections, the symptomatic fever which attends inflammation, whether this affection has been induced by external injury, or has occurred spontaneously in the body from internal disease; the hectic fever, supervening to long-continued processes of suppuration; the hectic state, and other morbid affections, which are sometimes brought on by the too sudden and ineffectual use of mercury to drive fevers, and the various disarrangements of the digestive organs, which are sometimes the cause, and at other times the consequence, of local diseases; the nervous affections, such as apoplexy, palsy, hysteria, paralysis, and mania, which arise not infrequently from injuries of the head; and locked jaw, or trismus, which is never classed by physicians, as it very rarely is to be induced by surgical means. These are morbid affections, the proper study and treatment of which, when they occur in internal diseases, are supposed to belong to the physician, rather than the surgeon; but occurring very frequently, as they do, in surgical diseases, and always modifying or aggravating the effects of these diseases, ignorance of their nature, relations, and modes of cure, is not only inadvisable, but highly criminal in the practitioner who attempts to undertake their treatment." — (*Thomson's Lectures on Febrile Diseases, Introduction.*) Also *J. R. C. Thomson, Treatise on the Diseases of the Nervous System, and on the Diseases of the Head, 1841.*

From what has been stated, I think it very certain that there never can be a complete and sensible division of the healing art into physic and surgery; and that all attempts to distinguish the morbid diseases and injuries of the human body into medical and surgical classes, are, in a great measure, to be divided by saying that the medical treatment of practitioners, rather than by any rules or principles which are at all necessary.

Mr. Lawrence joins all the most judicious practitioners in believing that the line of demarcation between surgery and physic cannot be easily traced; and he considers the distinction between them to be a mere matter of arbitrary usage. He employs the word surgery in its constant acceptance; understanding it to include all injuries of all kinds; Effly, The greater part of external and local complaints; Effly, Local internal affections, as produce changes from within externally; for example, alterations of figure, colour, or consistence; Effly, All cases requiring unusual topical treatment, operations, or unusual proceedings of any kind. This view coincides very much with the catalogue of diseases treated of in the present work; yet, such is the difficulty of separating surgery from physic by any verbal definitions, that every man of experience will immediately involve various exceptions to some of the foregoing principles of classification. Thus scurvy, or dysentery, which is an internal disease productive of change of figure, and often requiring an operation, is usually regarded as a medical case.

In the earliest periods, the same men cultivated the whole field of medicine. The writers of Hippocrates, Galen, Celsus, Placius, Aeginetia, Avicenna, &c. prove that the Greeks, Romans, and Arabians never had an idea of the human body being susceptible of only two classes of diseases, one of which formed the province of physic, while the other constituted a separate and distinct science, called surgery. They had no conception of two systems of pathology, one applicable to the exterior, the other to the interior parts of the body. They knew, as well as the best informed practitioners of the present day, that though each organ has its particular function to perform, no office is not independent of, but closely connected with the use and perfect state of other organs. Hence, as Mr. Lawrence has noticed, the expression of Hippocrates is perfectly consistent with the modern view of the human body, although various in structure and

sedious cultivation of comparative anatomy, that their industry adds no improvement in surgical science, whatever made, to enrich their nation; and that surgery is greatly indebted to them for the advancement of the diseases of the eye.

On the continent the Royal Academy of Surgery at Paris was long considered quite as the solar light of this branch of science. Nothing, indeed, contributed so materially to the improvement of surgical knowledge as this establishment, a noble institution, which, for a long while, gave our Englishmen better advantage even as in the cultivation of this most useful profession. The French literature, which, by a fatal abuse, consisted in the same pretensions both useful and pernicious sciences, did not spare surgery beneath its selfishness, in which credulous and trifling had been so long misled for the benefit of mankind. The various dissertations published by the illustrious members will serve as a perpetual memorial of the energy, ability, and success of which its objects were pursued, and varieties lesser practitioners will reap from the pages of its members the most valuable information. Although the Academy was deprived of the services of Lenoir, who died at an early time before its expiration, it yet kind at this period several successful works of continuing its labours, and supporting its reputation. Sabatier, Desault, who may be regarded as the Father of France, Chiquet, Lenoir, Pons, Dubois, Pons, Blandin, Pons, &c.

The Academy of Surgery in France was succeeded by virtue of the Ecole de Médecine. Desault, who had been almost a stranger in the country, became quite the leading physician in the latter. Several things recommended him strongly to the recognition and admiration of posterity; the character of his mind which he introduced into the study of surgery, the important studies of anatomy which he devoted to the treatment of fractures, a noble courage in his profession, which he knew how to employ in all his pupils; his liberal lectures upon surgery, which were the first ever delivered; and the boldness and simplicity of his mode of operating. Indeed, such was his genius, that even when he printed only methods already ascertained, he did them with so much substance, that he rather appeared as the inventor of them. From the Ecole de Médecine have issued Blandin, Boyer, Deschamps, Dubois, Lenoir, Moreau, Lallemand, Petit de Lenoir, Petit, Blandin, Chiquet, &c.

Among the public institutions in Europe for the improvement of medical and surgical knowledge, the general Medical and Chirurgical Society of London certainly stands pre-eminent, whether the reputation and number of its members, the importance of many of the papers which it has published, or the extended value of its library, be taken as the criterion of the character which is here assigned to it. Many of the facts which it has collected and published are of considerable practical importance, especially those relating to the subjects of aneurism, hæmorrhage, the diseases of the puerperal, in the bladder, and that kind catalogue of all diseases, especially in the library, which is that of the Royal College of Surgeons, is the most select, valuable, and complete collection of medical literature in Great Britain, more especially with reference to modern works, is continually receiving additions, both by large purchases in books and serials, and by the numerous donations of its members and others. The numerous and distinguished which such a society always maintains render the latter a most valuable resource of the profession, and that full to be attended with the most beneficial effects upon medical science in general, a person had no doubt of assistance in this kind alone, the spirit of inquiry is kept from flagging; and every individual who becomes a member of this society is enabled to make use of it in the world, with all the regularity which is important in any direction. My this observation, I do not mean that it will always appear in print directly after the communication to the society, so that to a circumstance which is so very much dependent upon those being as not a sufficient quantity of interesting matter as the Society's permission to be an additional part of its Transactions; but the very reading of the papers at a public meeting gives it immediate authority in the profession, and if it is thereby and worth to be given, it is certainly very great attention.

The measures of Lenoir, who guided surgery, pre-

viously constituted in the advancement of physiological science. His mind, richly stored with the positive facts which he had learned in the study of surgery, conceived no less a project than that of searching out the whole system of medicine. Some courses of lectures upon the materia medica, internal clinical medicine, and morbid anatomy, constituted this vast design, which was frustrated by a premature death. Indeed, as a physiologist and man of very critical genius, he may be considered as the John Hunter of France; but his qualities were of a different type, and hardly admit of comparison with those of Hunter, whose investigations were not limited to man, but extended to the whole chain of animated beings. Hunter died in the midst of his labours, and, in dying, his greatest effort was that of not having exhausted them. His example, says Richardson, gives most conspicuously when liberally always facilitated, and every man of scientific habits, how indispensable the study and every the practice of surgery are to him who would wish to be a distinguished and successful physician.—(*Narrative*, Chap. 4, p. 25.)

In the course of the last thirty years, great and general improvements have been made in the theory and practice of surgery.

Before the time of Mr. Hunter, our ideas of the general disease were surrounded with absurdities, and it is to his laboratory and the plain facts told before the profession by the late Mr. Ross, that the art is in an improved degree indebted for the improved discrimination and reason which have prevailed, both in the doctrine and treatment of the complaint. It must be confessed, however, that much yet remains to be made out, respecting the nature and treatment of syphilitic disease. Now I mention a greater point of the truth of this matter, that the remarkable change of practice as regards the syphilitic hospital in London, whereby being not contented in not using this specific at night or in less cases, for which this medicine a few years ago was always deemed indispensable? Nevertheless, taking all the characters of primary venereal disease, were also not to be made of simple diseases and diseases; and the necessity for violent treatment in all cases, begins now to be generally discredited. In short so different is every stage from what it used to be, that many persons are tempted to suppose the nature of the venereal disease truly altered.—(*See Venereal Diseases*.)

Recent to the student, an equally curious and interesting disease, more not well known of late Mr. Hunter published on the venereal disease. Until this time we were acquainted with a good practical method of applying mercury to the venereal disease, a method which has been well developed in the world, however, invented by Sir Robert Ross. The latter gentleman looked, but taken a very scientific view of the whole subject, and perhaps his only error is that of not having sufficiently valued his own insights of treatment.

In modern times venereal diseases, those common affections in every country, have received highly interesting elucidations from the labours of Drs. Casper, Richter, Sir Astley Cooper, Hey, Gendreau, Henschel, Scrup, Lawrence, Langenscheidt, Ciquet, &c.

The treatment of injuries of the head has been especially improved by Quercy, Le Dant, Petit, Hill, Denham, Denay, Hey, Abernethy, and Brodie.

The diseases of the vertebrae, which concern the primary of the limbs, formerly always killed the patient; but the method proposed by Mr. Pett is now frequently productive of considerable relief, and sometimes of perfect cure. The diseases of the joints in general may also be said to be at present viewed with much more discrimination than they were a very few years ago, and this great respect to better and more numerous valuable efforts are mentioned by Mr. Brodie, which keep to a trifling degree upon the whole anatomy, the study which he of late has been so much occupied with this part of surgery, will yet be the result of bringing to light some useful facts and observations relative to the pathology of the joints.

In the time of Mr. Pett, Sir James's patients afflicted with hydrocephalus were recovered; for soon after a first opening had been made, according to the method then in vogue, the disease was so severely cured with no further irritating fever, which hardly admitted of any control. Mr. Abernethy mentioned that much of this risk might be avoided by making only a small

Diseases of Antrix and Vagina, first published in 1815, a work which reflects great credit on English surgery, and contains practical precepts far superior to those of *Keegan*. A new edition of it, enriched with later observations and the latest experiments and reflections of the present author, I am happy to announce as being on the point of publication.

In the modern practice of surgery, a variety of old prejudices are gradually vanishing. Physicians look no more upon us, we are regarded as a necessary remedy and specific for nearly all cases of dyspepsia; and in these and many other instances, a cure is procured without any incision, and in cases beyond all modern cure. But the false idea that this treatment has any specific effect in effecting absorption, no longer binds the hands of the most superficial practitioners. The latter however are too ready, for the influence of food, and the strength can be rationally explained from the vegetable substances, and consequently cannot be the source of nutrition in the stomach, which can be made to manifest in the stomach.

The valuable discovery recently made in France, relative to the nature and character, the essential parts of Puerperal fever, assigned to a very small corpus, will lead to great improvement in the mode of prescribing this medicine in every case where it may deserve trial.

At the present day, the subject of mortification opens to us a new field for investigation, of the first rate importance. Every surgeon is aware that when a limb is deeply affected with mortification, amputation is absolutely necessary. This is generally acknowledged, but the period when to operate has, since the time of Mr. Pott, only been ascertained when the mortification has manifestly spread, and a line of separation is formed between the dead and living parts. All observations in which the disorder was in an ascending state, were left to their fate. In the most of the old surgeons, unfortunately inclined to deviate from this point: but as they did so without any discrimination or knowledge of the genuine character which ought to form an exception to the general rule, their all success cannot, as it is a just argument against the plan of separating earlier in a certain disposition of the case.

Now, if modern experience prove that many limbs may be saved by a timely performance of amputation, under circumstances in which it has until lately been generally condemned, it would be allowed that the recommended incision will be one of the greatest improvements in the practice of the present time.

For avoiding the consideration of this question, and resisting its design from the better path, the world is much indebted to that eminent military surgeon, Baron Larrey. His different and successful operations, and the success of those usually taught in the schools, the whole mortification will sufficiently prove.

Connected with this topic is *Suppurative Gangrene*, a name which denotes, more to be pointed out, as having received considerable attention of late years, and being much better understood now than the efficacy of the solution of pus, and strong acids, and has been so completely proved by the observations of *Boissac* and *Wohlfart*.

In the treatment of compound fractures, the success and importance positive suggested by Dr. Pott of Philadelphia, is much particularly noticed: various successful trials have been made of it in this country, and France (see *Notes des Chir. Fr. vol. 2 and 7*) and *Anger's Treatise des Maladies Chir.* as well as in America, and, though liable to failure, it is yet entitled to be regarded as a valuable addition to the plans already devised for these cases, which sometimes render the patient a tedious cripple during life.

The inextinguishable nature of Dr. Jones on *Hæmorrhage* has now produced quite a revolution in all the principles by which the surgeon is guided in the employment of the ligature for the purpose of bleeding, and the cure of hæmorrhage. Instead of thick elastic ties, small fine silk or thread are now generally used; and so far as the practitioners have been fearful of tying arteries too tightly, but the ligature can then, that it is now a particular object with him to apply the silk or thread with a certain degree of force, in order that the larger part of the vessel may be divided, so that he not draw the edges of the surrounding tissue within the artery, and impede the progress of the

arterialization, cannot be expected as a matter of certainty, and secondary hæmorrhage is more likely to occur. But in order to convey an adequate idea of the beneficial changes which Dr. Jones's observations are leading to produce in practice, I have been carried in the course of this paper, to give a summary not so much of the results of all his interesting experiments.

Dr. Jones, in several, small papers, deserves here to be also mentioned with particular honour, were he not probably the earliest writer that had the stroke on the advantage of tying the arteries with very small ligatures; one of the greatest improvements in the treatment of wounds and in operative surgery. "My experience and reasoning," says he, "led me to recommend a small ligature, and its utility and success were not left to conjecture, but clearly laid down; and the introduction of this practice to surgery is, I think, unequivocally due to me." Dr. Jones did not apply his small ligature to equine or the human body; and the practice of using the small single ligature was not adopted at the Edinburgh Hospital, in which all his experiments were made until the appearance of the following Essay on the Ligatures of Arteries, which was sent to the editor of the *Edin. Med. and Surg. Journal* in 1820, but was not published until the 1st of April, 1826. — See also the *Ligatures de Jones*, 1824. In justice to Dr. Jones I should mention that his book was published in 1820.

Wounds being very small, firm, round threads, instead of sows, the tapes or cords, as they are called a few years ago, whose modern surgeons have suspected that such would pull down from cutting off both portions of the ligature close to the hæmorrhage application, the removal of the ligature, &c. No one has failed so much as Mr. Lawrence upon the propriety of examining further the merits of this innovation. If we had effectual means for relieving a patient of hæmorrhage without the use of the knot, by the use of silk, catgut, the knot and suture on the artery, the practice will have a considerable improvement. The thread may then be brought together at every point; the quantity of hæmorrhage, water in the part will be lessened to almost nothing; the danger of any other affection will be reduced in proportion to a second cause of pain and irritation is diminished; and the chance of accomplishing perfect union by the first intention will be materially increased. Mr. Lawrence has tried the plan in many instances, and declares his experience has not found any ill consequences follow, while it has proved that such advantages are undoubtedly the result of it. Mr. Green, of Norwich, however, has doubted some observations which are rather against the practice, and it is especially for him being generally, or even cautiously adopted. After experience it was practised by several military surgeons in the late war, and although they probably did not employ exactly such ligatures as this mode is usually applied, few of them met with any instance of failure from the mistake of the use of suture tied in the wound, with the exception of Mr. Guthrie and one or two other army surgeons of my acquaintance. However, if large ligatures be used, the practice is not fairly tried, or rather the practice is not tried at all: because the great principle on which it consists, is the very small size of the composing the elastic substance left in the wound, where, such ligatures as Mr. Lawrence particularly recommends are employed. *Boissac* and *Rever* have also sometimes adopted the plan of removing the ends of the ligature close to the knot. — See *Parallèle de la Chir. Française avec la Chir. Française*, p. 111. See also *Journal de Chir. Française*, *Hæmorrhage*, and *Ligature*.

Another important improvement in modern medicine, I must not forget the present time rational method of dressing the wound, after the absorption of all vital operations, with light, cooling applications, instead of having for the part a barrier of irritating phlegm and sloughs, and a copious issue made of hot, low, dressed, and other foulness, vesicles, &c. The former the adhesive strips are the better, if they may hold the parts of the wound together. This is all they are intended to do. Whereas, if more than are necessary for this purpose be employed, they do harm by heating the part and covering the wound so entirely as to prevent the issue of the discharge. They also interfere with the progress of the cure, by preventing the escape of the effluvia of suppuration, and some

ferior work, hitherto kept alive by the useful support of credit societies, and patronized by the strict regulations of colleges, they will quickly find (what is truly disastrous) their point left. It is scarcely any principle of misapprehension to be satisfied as the profession, so it only be such as in the result of the kind of education which will furnish, taking in the elements of science and the elements of superior mathematics, and every all-inclusive that would insure the influence of this modern principle, need with external assistance and the hatred of every public-spirited man in the profession.

SURSEPTORY.—A bandage for supporting the wound; a top-dress. Bandages of this kind are very commonly used at the close, and indeed made by the surgeons themselves; therefore a particular description of them is not essential in this work. In cases of lacerated aneurism, rupture, abscess, some particular ruptures, and several affections of the neck, and sometimes even, a sequestrary bandage is of service.

WOUNDS. (From *ana* and *veia*.) A wound is said to be the edges of a wound, by keeping them in contact with each other.

Mr. Adams remarks, that "when a wound is recent, and the parts of it are divided by a sharp instrument, without any further violence, and in such manner that they are made to approach each other, by being directed with the hands, they will, if laid in their correct position, unite by adhesion, and coalesce, like one wound of a true laceration in another." To maintain them in this situation, several sorts of sutures have been invented and formerly practiced, but the progress of them has of late been very much improved. These are chiefly described under the *interrupted*, the *quilled*, the *plaster*, the *plaster*, the *plaster*, and the *plaster*, but the *interrupted* has proved to be almost the only useful one for the quilled suture is never preferable to the interrupted. The *quilled* suture is preferable in some cases to the *plaster* of plaster applied in many different ways to unite the lips of the wound, and the *plaster* is a very useful suture, which is recommended for superficial wounds to prevent the dryness of a scar, and to induce the frequency of union, because it is not so difficult to be removed, in case of a sequestrum and other matter. (*Opera* of *Napier*.) The *quilled* suture is described in speaking of the *quilled* and *quilled*, which also properly belongs to the present subject, forms a distinct article in this dictionary.

Interrupted Suture.—The wound being dressed from all sides of blood, and its lips being brought exactly into contact, the needle, armed with a ligature, is to be inserted from without towards to the bottom, and so on until the wound is closed. Care must be taken to make the puncture far enough from the edge of the wound, but the ligature should not pass through the skin and flesh. This suture, according to Mr. Sharp, may be done in four different ways. The other suture required are only repetitions of the same process. The *quilled* having been all passed, "you are in general to begin by tying three in the middle of the wound; though, if the lips be held exactly together, it will be of great consequence which suture you first." (*Opera*, *capitulum*, *lib. 1*.)

Surgical Suture in general.—The rule of Mr. Adams is a general one, and is based upon the fact of the union of the wound. The common rule is, that one suture is sufficient for every kind of the wound; but that is a very common mistake, and is not properly made, particularly when a wound is very deep, or extensive, or a transverse division of the vessel. As in the case of a laceration, it is necessary to pass the suture in a sufficient distance from the sides of the wound, but the thread should not pass through the skin in a direct line. Although Mr. Sharp says that the necessary distance is general, as there is a four-fifths of an inch, and others give the rule to be always half an inch, and the deepest part of the wound, or the most important part, particularly the last, as subject to numerous exceptions. When a wound is very deep, it would be consequently about, and even, in many instances, to drive the needle through a very thick part of the body. Other wounds of considerable depth, might be, in some places, from wounds of an inch deep, though it is not, which could never be required to pass paper.

The needle for making the interrupted suture will pass with the greatest facility when the edges are carried some way from the surface of a scar, and they should always form a track of sufficient size to allow the ligature, which they drive after them, to pass through the flesh with the greatest ease.

The interrupted suture is very useful in many cases, the interruption between the stitches, and it is the one most frequently employed. Its action is always to be treated and supported, either with the string bandage (see *Bandage*), or with strips of adhesive plaster (see *Plaster*), &c.

Quilled Suture.—As Mr. John Bell has observed, "When the wound was deep, among the muscular flesh, the old purpose imagined, that in large wounds could not be commenced by the common interrupted suture, however deep the muscles might be driven among the flesh, they were, besides, fearful of using the quilled (quilled) suture in deep gashes, but the wound should be made to adhere, especially when a large split open without, forming perhaps a sequestrum or deep collection of matter." They believed, that a deep, somewhat wound, could not be safely healed without a degree of suppuration, while they wished to keep it together at the bottom, they were afraid to close it very exactly at the mouth, but the matter should be collected in the deeper parts of the wound, as from this purpose (says Mr. John Bell) that they used what they called the compound or quilled suture. It is mostly the interrupted suture, with one difference, that the ligatures are not tied over the face of the wound, but over two quills or stiles of plating, or bone, which are laid along the sides of the wound. In performing this suture, we make first two, three, or four stitches either interrupted, rather very deep, and drive all the ligatures being put in, we lay two ligatures along the sides of the wound; then slip two ligatures into the loop of the ligatures on one side, drawing all the ligatures from the other side. (Mr. Bell should rather have said towards the other side), till the temple is fully covered down. Never lay the other bundle, and when the bundle of each ligature over it, and drive it also pretty deep; and that the ligatures, in form of an arch, go deep into the bottom of the wound, and hold it close, while the ligatures or quills keep the middle of the wound, and thus if it, pressed together with moderate pressure, and prevent any strain upon the threads, or any coarse and painful lying across the face of the wound." In a note, Mr. J. Bell says that he has lately corrected the quilled suture, but that Dr. De la Faye, (*Observations on Wounds*), says, it is good for deep penetrable wounds. The quilled suture is now scarcely ever employed; not that it is any advantage, except, perhaps, in some wounds in the body. (*See Principles of Surgery*, vol. 1, p. 26.)

I think the reader will more easily comprehend the manner of making the quilled suture, from the following simple directions. Take an artery needle as is usually intended to be made, run them with a double ligature, or one capable of being easily split into two, introduce the ligatures through the wound, cut off the needles, lay a piece of ligature along one side of the wound, and tie the ends of the ligatures over it. Next draw the other extremities of the ligatures, so as to bring the first piece of ligature into close contact with the flesh; lay the second piece of ligature, going the opposite side of the wound, and tie the other ends of the ligatures over it with sufficient tightness.

Quilled Suture. This has also the form of the interrupted suture. It is as described by introducing the needle that lies one lip of the wound, then within another, then into the other in the same way, and in this manner the whole track of the wound was closed up.

The *quilled* suture has long been rejected by all good surgeons, as it is never to be employed in cases of compound wounds. It was, however, till very lately that this suture was safely abandoned; so Mr. Sharp, and several eminent writers share his view, have introduced it into the practice of the modern and modern. From what has been said in the article *Wounds of the Arm* and *Wounds of the Arm*, the reader will perceive that even in such particular instances the *quilled* suture would not be applicable; so that it is, in every point of view, to be considered as totally disused in every case of surgery which can possibly present itself. What was necessary in making this suture, here many

tender, until a knot was at last formed in it, apparently of a sanguineous nature. Though this was at first as large as a middle finger, and gradually became softer and smaller, yet it did not disappear entirely. Having remained in that size weeks after the accident, the doctor put on a pair of shoes with heels two inches high, and contrived a steel machine to keep the foot in the proper position. This machine, however, he afterwards changed for another, made of the same material as the former. It was not till five months after the accident, that he thought proper to lay aside all assistance, and to put the strength of the tendon to a trial.—(See Moore's *Works*, p. 161.)

Both in a wound and rupture of the tendo Achillis the ancient method of using a salve for keeping the ends of the tendon in contact, is at present quite exploded, and position of the limb in the grand agent by which the cure is now universally accomplished. The following was Desault's method, which, though it was expressly designed to fill all the above-mentioned indications, may not be a more valuable method than what was adopted by Dr. Moore. After the ends of the tendon had been brought into contact, by moderate flexion of the knee and complete extension of the foot, Desault used to fill to the bottom on each side of the tendon, with soft lard and compression. This lard was applied to the limb made as much pressure on these points as on the tendon; and hence this part could not be depressed too much against the surrounding parts. Desault next took a compress, about two inches broad, and long enough to reach from the toes to the middle of the thigh, and placed it under the foot, over the back of the leg and lower part of the thigh. He then began to apply a few circles of a roller, round the end of the foot as far as to the lower extremity of the ischiofemoral compass. After covering the whole foot with the roller, he used to make the bandage describe the figure of 8, passing it under the foot, and across the place where the rupture was supposed; and the method was finished by encircling the limb upwards, with the roller, so far as the upper end of the thigh and last compress.—(See Moore's *Works*, *Chirurgie des Végétations, article de l'Ankylosis*, *Tom. 4*, et *Moore sur la Division du Tendo Achillis, in Œuvres Litt. de Desault par Boyer*, t. 1, p. 283.)

A rupture of the tendon of the extensor digitorum of the leg would require nearly the same kind of treatment as a rupture of the patella. However, in case of rupture of the broken part of the broken tendon should be avoided; the limb should be kept extended, and extended; a bandage might be put round the thigh, and antiseptic treatment be at first adopted. In the course of two or three weeks, the rupture should close, the joint to be very gently moved, without any violent pressure on the part of the patient's knee. When the ends of the rupture are not united as required, the limb is to be kept straight; cold applications are to be used for a few days; and, if necessary, strict antiseptic treatment pursued.

TENT. A roll of lint for dilating openings, &c.

TETTERELLA. (From *tetter*, a pestiferous infection.) A name, or nickname for scabies and other diseases of the skin. A tetther.

TETTERA. (From *tetter*, to bite.) A tetther, or tetther. Also an instrument called a protractor.

TETTERER, HERRASER OF. For an account of many of these appellations, I need refer to dictionaries in this Dictionary; for instance, *Cerveter*, *Petter*, *Herraser*, *Herraser*, *Herraser*, *Herraser*, *Herraser*, &c.

Dr. Desault observes that a disease of the body of the tendon, and in the same manner, it consists, in general, of such an extensive mode in the structure of that organ as produces a granulation by which, fleshy substance, instead of that firm, soft, fibrous matter which it naturally presents. "The disease," says Desault, "is a grey applied to every third coating of the tendon, attended with a total or partial conversion of the part into a fleshy granulation."—(See *Desault's Chirurgie des Végétations*, *part 2*, p. 144.) According to this definition, sarcosis becomes a term indicating of almost general application to marked softness of the tendon, where most of them are attended with inflammation and swelling of the part. "I find," he said, "that the old writers, and a great many of the moderns, call all

diseased inflammations and enlargements of the tendon according to whether the disease is a simple, chronic, tubercle, or cancer, unaccompanied with any symptoms of specific disease or malignancy, or whether it be a stricture, or what is still more difficult and more serious, a truly venereal disease of the organ." Even the fungus herniae of the tendon was, until lately, taken for a cancer.

Thus this vague method of applying the word sarcosis can be attended with no advantage, but on the contrary men have a tendency to destroy all useful classification, in a proposition the truth of which is self-evident. I am well aware that Mr. Pott, and many late writers, set out with an idea that every sarcosis has a propensity to change into cancer, and actual carcinoma, and therefore the latter status are considered by these authors only as stages of the same disease. Indeed, it is well known that a common isolated sarcosis, a simple fleshy enlargement of the tendon, may change into the peculiar malignant disease called sarcoma, or cancer. But yet it is by no means proved, that all the diseases which are comprehended under the name of sarcosis, are accompanied with a risk of their becoming the nature of sarcoma and cancer; for we know that the nature of sarcoma and cancer, is from the first to the last always of one character, and can never change into any other kind of disease. Neither do tubercles, or nodules, swellings of this organ ever undergo such an alteration as deserves the epithets of sarcoma and cancer. In opposition to the belief of Mr. Hunter (see his *Treatise on the Venereal Disease*, p. 20), some surgeons still imagine, that there is really one kind of chronic enlargement of the tendon arising from a venereal cause.—(See *Desault's Chirurgie des Végétations*, *part 2*, p. 144, *Article de l'Ankylosis*, *Tom. 4*, et *Moore sur la Division du Tendo Achillis*, *in Œuvres Litt. de Desault par Boyer*, t. 1, p. 283.) Now this also has usually been called a sarcosis; it was so named by Pott himself; and if there be such a case, no one will suppose that it, or any other form of bone disease, is capable of changing into a true sarcoma or cancerous disease. Perhaps, therefore, it might be more consistent and advantageous to restrict the application of *sarcosis* to an indolent fleshy enlargement of the tendon, unaccompanied with any present or future risk of sarcoma, or any mark of its being the effect of a specific disease; and as well as the case extends to other diseases, the name should correspond with the particular nature of the disease.

We need not here enter into a strict account of the various sarcosities, diseases, in which the tendon is subject. For they have no possibility in them, except what depends upon their situation; and the general characters of the different species of sarcosis will be considered in a future article.—(See *Tetter*.) The tendon is especially liable to three kinds of sarcosis, which have been named by Mr. Abernethy, the cancerous sarcosis, the tubercle, and the swelling. The cancerous sarcosis is called soft cancer of the tendon. It is described in this work under the name of *Fungus Herniae*. Sometimes the tendon is converted into a fleshy granulation mass. It is increased in size, and, when mature, a whitish or yellowish granulated matter is discovered, mixed with pus. This granulation is attended with so much pain and tenderness as a venereal disease of the tendon; nor does it produce any tolerable state of the limb.

As Dr. Baile observes, the swelling when first discovered is a hard mass of a pearly white colour, and generally increased with inflammation. Sometimes there is only a small mass, which is called with a cancerous fluid.—(See *Desault's Chirurgie des Végétations*, *part 2*, p. 144, et *Moore sur la Division du Tendo Achillis*, *in Œuvres Litt. de Desault par Boyer*, t. 1, p. 283.) This is the true *sarcosis* of the tendon, which is attended with great hardness, severe pain, and a swelling along the spine of the tendon to the joint, and an enlarged artery. In general, the tendon becomes in pain. To see Mr. Pott's words, see the history of the cancerous sarcosis in the text; but, passing it over, the swelling of the tendon, which swells the muscle, and is called a large, soft, striated, fleshy enlargement, with thin veins, or it is called a pearly, granulated, fleshy, and is frequent appearance.—(See *Desault's Chirurgie des Végétations*, *part 2*, p. 144, et *Moore sur la Division du Tendo Achillis*, *in Œuvres Litt. de Desault par Boyer*, t. 1, p. 283.) These latter states of the disease are denominated cancer of the tendon.

Should we hope, the *sarcosis* infection, coming from the venereal system, along the tendon, and even within the tendon itself. In this case, the

ping all cases time after the enlargement of the testicle.

In some unusual cases, the volume of the scrotum is increased with an enlarged testis, which occasionally appears in youth also, and presents the appearance of an enormous scrotum. An example in which the former weighed three lbs has been published by Dr. Tilley.—*See Med. Clin. Trans. vol. 8, p. 73*.—In one case, recorded by Dr. Cheyne, a swelling of this kind was as large as an child's head. On dissection of the parts, the testicle and epididymus were found to be quite free from disease. The largest concealed swelling from an enlargement of the cellular membrane, which immediately covers the external surface of the vaginal coat. Two curious diseases were observed in women's ovaries, and several instances of it were met with in Eggs by Harris Laney.—*See Med. de Chén. Jekere, t. 2, p. 116, et seq.* Mr. de Velde lately at Dublin, observed one in a case in which he had removed from the scrotum a large mass of fat, containing the testes and even a hydrocele.

The operation of castration is the most efficacious of relieving the patient from varicose. This measure, however, is not practically applicable, nor is it always necessary; for sometimes the enlargement of the testicle subsides of itself, displaced by the absorption and removal of internal morbidities and external appearances. The hope of accomplishing this desirable effect may be occasionally entertained, when the swelling is not very large, when it has not existed a considerable time, and when it is not attended with very great inconvenience. Experience has proved, that some kinds of varicose have yielded to the treatment of tincture (*Morrey, Fragile, and Rose, in Chemical Dispensary*); in a dissection Harris gives (*Hippocras del. Med. Acad. Berol. Clin. Berol. t. 7, p. 504*); in French and Latin (*Waller*), in German (*Le Dyon, D. Hoff, Malacodon, Delphic*), in the external use of the *lycopodium*, *atractyl*, and *compounded mercurial ointment*, in powder containing (*Fleming, d. Med. Trans. vol. 6, p. 10*); in a lotion made of a strong decoction of haddock (*Waller*); in the application of mercury, in repeated employment of iodine, and the application of cold, &c. It also sometimes happens particularly in females, that the internal and external use of the preparation of iodine are found to be attended with strongly marked efficacy, in cases where the affection of the testis, especially those reputed to be scirrhus. Many facts of this kind have been reported to me by my patients, myself, similar ones I have witnessed myself, and they are well worthy of being remembered in practice.—(*See below*). The operation of all these means may be advantageously preceded by the external use of a bag made, the coverings as much as possible, of a horizontal position, and attention to a suitable low diet.

Mr. Port believed, that the man who has the varicose is to be affected with a varicose, but very little change of getting rid of the disease by any plan, except castration; and all the time the operation is deferred he carries about him a pair, not only useless, but burdensome, and which is every day liable to become worse and unfit for such an operation. Now, although there is a great deal of truth in this opinion, yet, I conceive, it is rather exaggerated, and that it would tend to diminish the practice of castration to an extent beyond all necessity. Particularly since with Mr. Port, that there never was a varicose case, where the enlargement of the testicle had been destroyed by disease, or where the disease had suffered so much as to render it incapable of the office for which it is destined. But such some reason always be known in respect to, natural examination; and were a surgeon to be directed to the body every testicle which he finds affected with indurated swelling and induration, and not readily reducible, he would immediately apply such order as to the above plan of treatment, which would be perfectly cured. That there are some cases of enlargement of the testis, which may be viewed, as a mark, of which experience must have observed the generality of surgery.

The scirrhus testicularis, and several other swellings of this organ, which are very imperfectly understood, may sometimes be benefited, and even entirely cured, just like some analogous affections of the breast. What is termed the *scirrhus testicularis* (Mr. Port always always gives way to a mercantile course, properly con-

ducted. The diagnosis of this case, it must be confessed, is not very clearly explained by surgical writers, nor was it really acknowledged by Mr. Hunter. According to Mr. Port, it is indeed a variety of scirrhus; and he does not therefore ever to have seen an instance in which it was not either immediately preceded or accompanied by some other appearance plainly varicose. He adds, that it has marked the irregularity of the point of varicose. But the question whether the case is really varicose or not, is far less interesting than the question whether there are not many varicose which may be diminished and cured by surgery. The affirmative cannot be questioned. I have seen many such cases myself, and they are frequently recorded on record. A statement of several has been lately published by Robertson.—(*See Næphrologia Chirurgica, t. 2, p. 386 of top. vol. 4*). The authority of Hippocrates is also on the same side.—(*Præf. Epidemiorum de Morbis Hippocratis t. 3, p. 364*).

Indeed, this last writer comments, that many varicose swellings, and even of the testicle are so much alike in their progress, that the difference of their situation should always be at once detected by the punctation. Hence, although I am an advocate for the early performance of castration in cases of varicose, when there is reason to suppose the disease to be advanced, that the organization of the testicle is totally destroyed, or where internal and external remedies have been used a certain time, as I say; yet these sentiments do not induce me to recommend the operation in other affections, in which the disease is quite recent, and no plan of treatment previous to the operation is tried. I have already examined various cases of scirrhus, which have been proved by experience to be sometimes capable of being cured. The disease of the testis, which is usually called the *scirrhus testicularis*, like other forms of scirrhus often goes well spontaneously after a certain time, and it may frequently be considerably benefited by administering internally the correct medicines, and such doses of the substance of mercury, bromine of mercury, or positions of surgery, being applied to the scirrhus. The good effects of iodine in such cases, I have already noticed. Several other incident enlargements of the testis yield to iodine with comparatively momentary advantage to the scirrhus. The late Mr. Robinson thought that some scirrhus might be relieved by dressing with leeches, a supposed morbid irritability of the urethra, with which he thought it him to connect the origin of the complaint.—(*See Pract. Obs. on Scirrhus, &c.*) The history of this supposition, for a time, attracted considerable notice; but the interest which it once enjoyed has now died away, a sufficient proof to be made, that the practice mentioned was not of much value.

From the preceding observations, it may be inferred that all disease enlargements of the testis are not curable; but that we ought at the same time to be duly impressed with the expediency of not waiting too much time in the trial of means which we are to be depended upon, and which, if continued unnecessarily long, might show the disease to advance too far to be capable of being afterwards effectually extirpated. According to Mr. Port, the circumstances in which the operation of castration is advisable or not are of two kinds, and relate first to the general habit of the patient, and the disorders and indispositions of some of the viscera, or to the state of the testicle and spermatic cord.

A pale, sallow complexion, in those who used to look otherwise; a weak constitution, and almost apoplexy and death, without any more disorder; a fever of the testis kind; and frequent pain in the back and loins; are, in those who are afflicted with a scirrhus testicularis, such circumstances as would induce a suspicion of some latent morbidity in some of the viscera, in which case, as Mr. Port truly observes, no cure from the mere removal of the testis is not to be expected. They whose constitutions are spoiled by intemperate practices in their being attacked with this disease, who have hard liver, and aqueous humors, he says, are not proper subjects for such an operation. Hard recovery within the abdomen, in the regions of the liver, spleen, kidneys, or rectum, indicating a diseased state of the said viscera, are very material objections to the removal of the testis and spermatic cord. In short, whenever there are manifest

uniformly met with in every case of rapid or violent death. Besides the rigidity and increased sensibility of these parts, Baron Larrey has likewise stated that the pharynx and oesophagus were contracted and refused either food or liquid nourishment. He also found sanguine hæmorrhages in the bowels of the several patients who died.—(See *Mem. de Chir. Militaire*, t. 2, p. 462.) This, however, is evidently an accidental complication, and not a disease. In several cases, Dr. M'Arthur found the intestines much inflamed; and in two of them a yellow watery fluid, of a purulent effluvia, pervaded their mucous surface; but whether the inflammation of the pharynx or only a consequence of the pressure of the abridged muscles, which contract in violence in this disease, he is unable to decide.—(See *Brit. Chir. Trans.* vol. 7, p. 65; and *Baron's Synopses*, &c. *Tetanus*.)

Dr. Louis Chambers, of Charleston, South Carolina, states that when the disease forms very quickly, and reaches the uniformly present with the whole train of its characteristic symptoms in a few hours, the disease is pronounced by the rigidity of the attack, and that the patients then succumb generally in twenty-four, thirty-six, or forty-eight hours, and very rarely survive the third day. But when the disease is somewhat less violent in the attack, he is unable to decide.—(See *Brit. Chir. Trans.* vol. 7, p. 65; and *Baron's Synopses*, &c. *Tetanus*.)

From the valuable report of Dr. James Magrath, it appears that several hundred cases of tetanus occurred in our army during the five campaigns in Spain and Portugal. The disease was observed in some on several occasions after the receipt of the local injury, but it terminated on the second, third, and fourth days, and even at one of our detachments where it continued, though it was usually the post-mortem beyond the eighth.

—(See *Brit. Chir. Trans.* vol. 8, p. 325.) I had a patient, however, who expired in the military hospital at Falmouth six weeks after running between, before he died. This happened in the year 1814, soon after the capture of Bayona by Buonaparte, when the patient had been wounded, and a medical suspicion of the truth.

Although tetanus is a disease which has been observed in almost all parts of the world, experience proves that it is especially so much the greatest in warm climates, and especially in the low countries of those climates. The disease is common in many situations and countries bordering upon the sea, and in places situated very dry, elevated, and at a distance from the sea. Every class of individuals is exposed to the attack; but within a few days after their birth, and children and persons are said to be often affected with older persons, or they in the youthful period of life. The young are more frequently seized than the female; and the female and children more frequently than the male.

According to Dr. Osler and other medical writers, the causes of tetanus are cold and moisture, applied to the body while it is very warm, and especially the sudden transition of heat and cold. Of the disease is produced by morbid humors, or other injuries. When wounds, however, tetanus is probably more often caused, which it is not directly known.

Baron Larrey observed that post-mortem wounds in the course of the service and the troops of the army often produced tetanus in the climate of Egypt, particularly when the patient or temperature passed from one climate to the other, in damp situations, and in those which were subject to the heat of the sun. What he observed and noticed subsequently was the most subject to the disorder, the extent of which was found to be almost always fatal.—(See *Mem. de Chir.* &c. *Tetanus*.)

Through tetanus is regarded to proceed of course from wounds of the extremities, then from wounds of the head, neck, and neck. Sometimes it is regarded as the symptom of the disorder, as in the tetanus, mentioned by the late Professor Boissier of Edinburgh; but in general it does not arise in all wounds. It is observed, sometimes, and the wound is merely a slightly lacerated, and free from all pain and violence. Wounds of every description that give rise to tetanus, and in which tetanus has been fatal in the post-mortem. Thus, in Egypt, Larrey had tetanus, which terminated from the laceration of the muscles of the hand in one of the soldiers of the army.—(See *Mem. de Chir. Militaire*, t. 2, p. 254.) In colder climates tetanus is observed in lacerated wounds, even when cold, moist, or lacerated wounds; or

wounds of the glistered plant, with laceration of the tendons and ligaments, contused fractures or dislocations, deep lacerations in the sole of the foot, and especially lacerations of the tendons of the fingers and toes. A partial division of a nerve has been supposed as a cause; but as some nerves must be imperfectly cut through in almost every wound, and yet tetanus does not arise, the reality of this cause is doubtful. Besides, if it were true, the cure would be easily effected, by making the division of the nerve complete, which experience contradicts. Baron Larrey, however, has observed a fact which favors the opinion, and it still presents itself; and a case in which the laceration of the tendons of the foot to the thumb was found only from strength, and as extremely inflamed and lacerated, has been related by Dr. Larrey.—(See *Mem. de Chir. Militaire*, t. 2, p. 254.) The inclusion of the nerves in the wound applied to tetanus is another alleged cause of tetanus; and as this fact is very common, and tetanus rather rare in this country, while it may follow all sorts of wounds, whether from perforation or rupture, the accuracy of this opinion may also be doubted. In support of it, however, there are some cases and observations adduced by Larrey, which will be given in the sequel of this article.—(See t. 2, p. 254, &c. *Mem. de Chir. Militaire*.) At the same time I do not seem to find that the nerves are not sometimes in tetanus, as if the practice is not now a second time. Amputation and cauterization are the only great surgical operations in which I have seen tetanus succeed; though it may follow the amputation of the limb on some occasions.—In Dr. Boissier's Hospital, it was followed the operation of removing the foot.

In warm countries, tetanus is an ordinary consequence of all kinds of wounds.

There cannot be a doubt that differences of climate induce considerable differences in the nature and danger of tetanus. Larrey found that in Egypt, the disease was more intense, and more violent, sometimes to hydrophobia than in the other climate of Germany. In both these countries he remarked that, when the wounds causing tetanus injured nerves, situated on the first part of the body, tetanus was more common; that if the posterior nerves were lacerated, tetanus followed; and that when the wound extended from the first part of the body, tetanus was less common, though it is likely as to require equally both descriptions of nerves, complete tetanus ensued. He observed, also, that the disease commonly arose from wounds when the climate and temperature passed from one extreme to another. Regarding to the cold, damp, continued air he found particularly conducive to it.—(See *Mem. de Chir. Militaire*, t. 2, p. 254.)

In the low countries in Spain and Portugal, according to the report of Dr. James Magrath, tetanus occurred in every description and in every kind of wounds, from the situation to the most elevated; it followed the healthy and the sloughing, the fetid and the lacerated; the most simple and the most complicated. It occurred at uncertain periods; but it was remarked that, if it did not commence within twenty-two days from the date of the wound, the patient was safe.—(See *Brit. Chir. Trans.* vol. 8, p. 325.) In Egypt, as we learn from Larrey, the latest period of the commencement of tetanus after a wound, was from the fifth to the eighth day.—(See *Mem. de Chir. Militaire*, t. 2, p. 254.)

It is observed by Dr. Boissier, that at the same time of tetanus is an inflexible fatal, it is of the greatest importance to attend to whatever may tend to destroying the disease early, or to reducing it off. Boissier states that it is wounds producing convulsions and tetanus, a presymptomatic of the whole during which often gradually passed before any affection of the lower jaw; and we should naturally give our attention to any affection of this kind as presymptomatic or tetanus, particularly of the tendons of the hand, forearm, back, &c. Some physicians maintain that tetanus may often be derived from the laceration of pain, irritation, excitement, nervous tenderness, pain and difficulty in deglutition, or in turning the head, or in partial rigidity of some of the voluntary muscles; pain at the cerebral centre; a suppurative or empyema of the discharge, &c. which such the slower approach of the disease. Larrey adds several varieties of tetanus, in which the

Wound was either dry or afforded only a scanty serum exudation, and where the symptoms were relieved on suppuration being re-established, and Dr. Reed (*Eccl. Med. and Surgical Journal* for July, 1854), remarks, that on removing the dressing the wound was covered with a darkish crusty-looking matter, and that he had seen this change the occurrence of pressure in two other instances. A vapor of the exudates has previously been observed to protrude at will in necessary the dressing, and Boyer, in discussing exanthema in obstinate cutaneous eruptions, makes the following remark:—(Treatise Med. Chir. &c. 1, p. 255.) Mr. Abernethy also informs us, that in such cases we must be regarded into the state of the vessels, the exanthema were not the seeds, and he proposes as a question, is investigating the cause, what is the state of the blood, is between the influence of the injury and the appearance of this morbid exanthema?—(Abernethy's Surgery, Works, vol. 3, p. 304.) Dr. Ferri thinks the tendency of the circulation a useful criterion of the danger of the disease, and observes, that if the pulse be not above 100 to 110, by the fourth or fifth day the patient almost always recovers. But even if it be upwards of 140, the disease usually proves fatal, and nevertheless a few instances of recovery where the pulse continues to 120 on the first day.—Baron Lundy remarks, that when the perspiration which so often attends the disease is symptomatic, it begins upon the head and extremities; but that when it is diaphoretic, it comes over the chest and the abdomen.—(Galenus Chir. Medicae, l. 1, p. 235.) It is much to be feared, however, that in such cases perspiration does very faintly, with out sufficient relief (*Revue Chirurgical*, art. Dittmar

It has proved to be exceedingly more consistent of tetanus, a subject of infinite difficulty, because the disease frequently baffles every mode of practice, and, in certain instances, goes well under the employment of the very same remedies which *seemingly* fail in other similar cases of the disorder. Every plan has, certainly, been tried, and every plan has still more frequently succeeded. The great difficulty, therefore, is to ascertain, among numerous dissimilar accidents, what position is held on the whole to be attended with the least ill-success? For in the present state of our knowledge, the most judicious practitioners will not differ far from the supposition, that any essential remedy for tetanus has yet been discovered. As, however, acute tetanus was regarded by Hippocrates and the ancients as curably fatal, and as open not always proven as modern things, it seems allowable to conclude that the occurrence of such now happens is due to merited improvements in practice. This reflection would lead us not to give either subject as hopeless; but to redouble our exertions for the discovery of a more successful method of treatment, and, if possible, of some new medicine, possessing more specific powers over the disorder.

As it is justly observed by a well-informed writer, when we reflect upon the obscurity which involves both the *causæ ætiologicæ* and the *proximate causæ* of nervous affections, we need not wonder that the practice in these disorders should still be entirely empirical. The indication of cure, which is generally applicable to all diseases, namely, the removal of the exciting causes, has but little place in a nervous condition, which is the consequence of causes that in general have ceased to act, or which it is not in our power either to remove or control. In those cases, where we could suppose local irritation to be still operating, the most effectual method of counteracting its effects on the system would obviously be to interrupt all communication between the seat of the irritation and the nervous system. If, however, the disease has already established itself, and the system is again healthy, even so, it does not appear that this could succeed in arresting the course of the disorder. Experience has but too fully proved, that the apparatus of the limbs, from the injury of which the spasms have arisen, will very seldom permit even a mitigation of the spasm, and, if permitted after a certain period from their first appearance.—*Rich's Dyspepsia, etc.* *Spasms*—Barro Laffrey has been the greatest modern advocate for the performance of operations in cases where, in his opinion, depends upon a wound of the externalities; but the facts which he has adduced in its favour are not numerous, and he finds his representation of the necessity chiefly to derive vanity, and exclude it is a

others, except on the very first occasion of the imp-

The usually unexpected and rather serious Larry, obtained by the strength of his jaw, took, in the process of an—seemed to Chris—telling, he was to prepare to—some part of the exhibition, it would be the—signify the danger that immediately he was—brought himself, rather than expect him to—pieces of nature, and from very accurate results, a case which is seldom happens?

"If present, it is elastic," he is somewhat over-
stating, as it may be *less* in every point of the
center, provided a choice be made of the line
there in the interpretation of the structure. The
upper middle arch, however as well as some of the
lower, the diameter were widened, and the muscle to be
raised were strongly contracted, and, in a little
obscured in the angle of Arch in a rather early
action with rotation, in interpretation of a possible
rotation of the left elbow. — (*Ann. of the Acad.*
1, 3, 3, 202.)

Many old, faded, yet legible, is a few details of acute interests. In the case last cited the symptoms were already considerably advanced when the experiment of reanimating the man was made, and, says he, the operations were followed by considerable success. The symptoms returned, however, a few times afterward, and proved fatal on the third day. In another case, also, the gentleman opposed the treatment, though some friends said he was. The action is described as having stopped at the throat, and, at that point, by exertion [?] the pressure was passed twenty bones in perfect ease, but, I regret to say, the sharp cold air, the disagreeable heat, and other circumstances—(See *Mem. de Chir. Militaire*, t. 1, p. 232-233)—led to a loss of acute interest, where Mr. Bland suggested the worsted band, the symptoms remained following day; yet the case ended fairly, and is a question, whether the degree of temporary shock which was obtained did not prove fatal to the fracture. Tried in conjunction with the operation—(See *Art. Med. and Surg. Journ.*, N. Y., 79, p. 232).

Lately, wounds soon close in Great Britain, and the consequences of disease are lessened, and especially for the relief of the disease in the chest. From the late knowledge obtained on this subject, it is now possible to relieve and even to cure the disease off all communication between the cavity of the wounded part and the atmosphere by a suitable instrument.

In this place I think it right to remind the reader, although Harper Lacey once or twice admitted when some tenants had suggested otherwise, he did not subscribe the principle, and he certainly neither in sections of acquisition in Chicago, or in some isolated cases of tenements, and to a few farmers in 1893. In playgrounds and in districts, without which, as a representative of the class, would possibly require no operation.—(See Mem. of Chas. M. L. B.) The report of Sir James Macpherson, lately confirmed the statement of Lacey, namely, that the tenants were a little afraid in the night and fully bowed down by that superstition falls in the same kind of way. In the latter of Toronto, this operation was somewhat tried, but without success. The French are usually to have had an immense number of soldiers, but because after the battle of Verdun, when, it is well known, that the practice of acquisition was hardly tried.—(See Mem. Chas. Travers, vol. 1, p. 18.) We have seen, however, that according to the reports of Lacey, the English might have only performed the operation in eleven cases, which was the last, for instance, or if in other instances, may be the very first acquisition of the acquisition. Perhaps while not abandoning the greater degree of that applying Lacey's statement, there is nothing in it deserving any better, than attention to the report, in cases of extreme tenants, who seem to be actively adopted. The average effect of the operation, however, and the occasional possibility of a return to the conclusion by a single year, will be a considerable immediate advantage to the tenants.

Since Gertrude, widow of the late Sir Arthur Conan Doyle, has published his records of spending the plot of *Dragnet* in class of the

and they tend to confirm the opinion which I have always given upon the subject. In one case of tetanus, from a compound fracture just above the ankle, the operation seemed to postpone the fatal event. In another case, the leg was amputated without any good, and a third case is referred to, in which the operation also failed in curing the puerility. In chronic tetanus, amputation is reported by Sir Astley Cooper as ineffectual, as the paralytic action returns without this proceeding. The medicine which has succeeded in this puerility must be useful in such cases, as the substance of mercury joined with opium—(*Surgical Essays*, part 2, p. 180.)

Dr. Abernethy, in his lectures, also disapproved of amputating any important part of the body with the view of relieving tetanus, unless the injury exposed the possibility of its being prevented by amputation; however, that he has seen tetanus mitigated by the practice, though the patients ultimately fell victims to the disease.

On the subject of making incisions for the purpose of separating the disease of the wounded part from the system, Larrey states, that they should be performed before inflammation has commenced; for if this has reached progress they would be useless and even dangerous. They should consequently, as much as possible, be at the remote extremities and superficial parts. As he considered all incisions very painful, as exacerbating the symptoms of tetanus, instances of which he has observed. The Surgeon has resorted more to covering parts of the body with lint, arising from completely dividing the track of the injured nerve. In one instance tetanic symptoms followed an injury of the sympathetic nerve, but were immediately stopped by dividing some of the fibres of the sympathetic cord, and the tetanus and convulsions, deep to the bone.

On the principle of destroying the parts which are the seat of the local irritation, Larrey also frequently applied the actual and potential caustery to the wound. The application of caustics, says he, may be performed with advantage on the first attack of the symptoms, the same concept being directed to its striking the incision. Bleeding, leeches, and the usual topical remedies and doodynes, may follow these operations. Though in general they have little effect—(*Mém. de Larrey*, *Annuaire*, vol. 2, p. 248.) In the third volume of this interesting work, p. 271, &c. are several cases in which the caustic was employed with success. We could not exclude, however, that such dependence ought to be placed in the use of the caustic, since Larrey observes, in another place, "The actual and actual caustic, recommended by the Father of Medicine, have been equally unavailing. The actual was employed at Jaffa upon three wounded men; the disease nevertheless followed its usual course, and destroyed finally."

"I have used a striking instance of the inefficiency of the second method, in a case of opisthotonos."—(*J. J.*, p. 258.) This author also addresses some cases which tend to support the opinion, that tetanus occasionally proceeds from the infection of a large nerve in the ligature applied to an artery. The use of French Brandy as a direct of tetanus consequent to amputation, and upon extending the stump, the median nerve was found included in the ligature with the artery, and as extremely swollen, and swollen—(*Mém. de Larrey*, *Annuaire*, t. 3, p. 267.) In another case, Larrey suspected the tetanic disease to proceed from a putrid branch of the trunk nerve being cut together with the spinal artery, and he cut the ligature; but the relief was only partial and temporary. The patient was therefore applied deeply to the whole surface of the stump. A violent convulsion took place a few hours afterwards, and the patient recovered. A diaphoretic mixture, with camphor and opium, was also exhibited—(*J. J.*, p. 267.)

Among other local means for the relief of tetanus, we might as well omit the employment of Muriatic acid as much as possible in the wound, or their application, or that of the stimulus of camphor, or the liquid itself. Almost all modern writers have observed, that tetanus is interrupted by its intermixture, and in its progress with an intermission of total cessation of spasm in the wound. Hence, the indication to excite this pause again, by the means which I have specified. Clearly seems to have adapted both plans; but he particularly applied the element of caustic.

due to the wound itself is an early stage of the spasm, and in cases where there not only tend a suppuration of the discharge, but where he suspected the nerves of the wounded part had suffered from exposure in the cold damp air, or the detachment of the muscle. The facts in favour of these local means, the reader must refer to the first and second volumes of the *Mémoires de Chirurgie Militaire*.

It appears also from Larrey's experience in Egypt, that patients, made of the waters of Salsola, and applied to the wounds of persons labouring under tetanus, are followed by no advantageous effect. The alkalies also proved of no service—(*J. J.*, p. 261.)

I shall conclude these remarks on what may be offered the local treatment of tetanus, with mentioning, that the celebrated Dr. Rush recommended the wound to be dressed and dressed with oil of turpentine (*see Treatise of the American Phlog. Society*, vol. 2); and that some of our naval surgeons have used tincture of opium as a dressing.

A great degree of obscurity prevails respecting the most eligible period for constitutional plans of treating tetanus, and I am afraid, it will be perceived, that our internal remedies cannot be more depended upon than the local means already described. This opinion is fully confirmed by observing in the foregoing fact, referred to by James Macgregor, that out of several hundreds of cases which occurred in the British army during the late campaigns in Spain and Portugal, there were very few which terminated successfully, or in which the remedies, however varied, seemed to have any beneficial influence after the disease had reached a moderate progress—(*Med. Chir. Trans.*, vol. 6, p. 448.) The possibility of doing much good by internal medicine is also sometimes totally prevented by the inability of swallowing, which afflicts the patient. In short, the present state of our knowledge, respecting tetanus, will not allow us to indulge much hopes of cure from any means yet discovered, except in the chronic form of the complaint; the resources of success in the treatment of acute tetanus being by no means numerous, and not the result of any determinate plan of treatment.

Of all medicines, again, is that which has raised the greatest expectations, and been the most extensively tried in cases of tetanus. Indeed, there cannot be a doubt that, in many cases, with more it is compared to effect a cure. But for this purpose, it is absolutely necessary that it be in larger doses than the current quantities of the symptoms; that it be given in very large doses; and that the doses be repeated at short intervals, so that the system be kept constantly under the influence of the remedy. It is, indeed, astonishing how the system, when subjected under a tetanic disease, will mask the operation of this and other remedies, which, in its ordinary state, would have been more than sufficient to overpower and destroy it. Patients with tetanus will bear, with impunity, quantities of opium which at any other time would have been certainly fatal. Instances are upon record of five, six, and even twenty grains, being taken every two or three hours, for many days, without any extraordinary narcotic effects being produced upon consciousness. It is perhaps advisable, however, to begin with comparatively moderate doses, such as half or one drop of the tincture of opium, which may be repeated at intervals of three or four hours, and increased at each repetition until some sensible effect is produced on the system. It seems requisite to augment the dose rapidly, as the disease presses upon us every hour, and so that we may be lost when there is yet a chance of conquering its fury. The approaching closure of the jaw, and difficulty of deglutition, which may prevent us thus readily it is hardly possible to introduce medicines into the stomach, are notional motives for pushing our remedies before such obstacles arise—(*Précis de Médecine*, art. *Tétanos*.) I once supposed it possible to overcome this impediment by introducing a flexible catheter down the oesophagus from side of the nostril; but this attempt to do this always terminated in a violent prostration of spirits, attended with such a sense of suffocation that it could be endured. The experience of my friend, the late Mr. Crichton, of Bath; and that of Baron Larrey, have fully proved, that no sedatives can be derived, in these circumstances, from the use of flexible tubes—(*see Mémoires de Larrey*, *Annuaire*, t. 1, p. 257.) Sometimes,

however, the obstacle to the administration of medicines arising from the closure of the jaw, is prevented by loss of some of the incisor teeth, and, in a few instances, Baron Larrey adopted the plan of extracting two of them. This would be tedious, however, were deglutition be totally hindered, as happened in two instances recorded by the latter eminent surgeon.—(*Op. cit.* t. 5, p. 331.) Clysters are the only remedia which the spasm of the Glæva cannot be overcome. In this way, as much as a bucket of the extract of opium has been introduced into the bowels at one dose. Opium friction upon the jaws, throat, and other parts of the body, have been practised. Opiate plaisters have also been applied to the diaphragm muscles, and behind the ears. This external use of opium, however, can only be regarded as a feeble and probably useless method.

A curious fact, noticed by Mr. Anstey in his lectures, seems to offer some explanation of the little effect of some of the most powerful medicines on the irritation in tetanus; on opening the stomach of a patient it was found that he had died of tetanus, after taking three doses of opium, many drachms of this substance were found undissolved in the stomach. Whether opium will have more power over tetanus than the common preparations of opium, must be decided by farther experiment; but I confess that my own expectations or so desirable a circumstance are not very sanguine.

As the convulsions always produced by tetanus is rendered still more nervous by spasm, laxative medicines and opium should constantly accompany its employment. The weakness of the artery physicians, as we learn from the report of Sir James Macgregor, is highly in favour of a rigid pericranium: is the use of blisters given in adequate doses to produce daily a half effect. Dr. Ferrius notes, that a solution of sulphate of magnesia, in infusion of scum was found to be more better than any other purgative; and it was daily given, in a sufficient quantity to prevent a copious evacuation, which was always dark coloured and highly offensive; and to this practice he chiefly attributes, in one severe case, the removal of the disease.—(*Med. Clin. Trans.* vol. 6, p. 452.)

A spasmodic rigidity of the muscles being the most prominent symptom of tetanus, it was treated for some time by the effects of some other muscular medicine besides opium; and those which have been particularly the subject of experiment are camomile, ether, the common mustard, bark, castor oil, and lastly the digitalis. In many cases, opium and camomile have been exhibited together. Indeed, Larrey asserts, that of all the medicines hitherto proposed by skillful practitioners, the extract of opium combined with camomile, and the tincture of potassium, in a small quantity of the alcohol stramonium, and given in doses more or less strong, produces the most favourable effects, since patients, who have no attention to other fluids, take with pleasure this mixture, the action of which upon the system is attended by necessity, and Quina, under the circumstances which have been specified.—(*See, Med. Clin. Trans.* t. 1, p. 22.) In the same work, several cases are detailed which were benefited by such treatment.

Although some practitioners have thought that they saw good effects result from bark, yet the majority, who have made trial of both this and camomile in cases of tetanus, have found no reason to recommend these remedies. One hundred and fifty grains of bark have been given in the space of twelve hours, to a young girl, without effect, not assisted with an increased quantity, but on contrary effect on the disorder was produced.

We learn also from Sir James Macgregor, that ether, camomile, castor, and other antispasmodics, as likewise the alkalies, were tried by our military surgeons in Spain, and found unsuccessful.—(*Abdoen-Clin. Trans.* vol. 6, p. 453.)

From the same authority we find, that digitalis, in large doses, was used in several cases in the Peninsula; and that it, with several other medicines administered, failed in almost every case of acute tetanus which occurred.—(*P. 44*). In one case the pre-mentioned failed in the last, and the patient was recovered five days afterwards.—(*P. 45*). I am not acquainted with the particulars of any case in which belladonna has been given, but whether it be a remedy worthy of farther trial.

Analogy has also led to the employment of the warm bath, as a plan which seemed to promise great benefit, by producing a relaxation of the contracted muscles. But notwithstanding this method has succeeded in some instances, is seldom more than palliative, particularly when the practitioner has been connected with the Government, is generally false, and often has more than succeeded. This may perhaps be, in some cases, attributable to the circumstances and amount which is poured into the muscular system in order to produce the bath; for it is very well known, that every exertion on the part of the patient is very apt to excite violent paroxysms of spasm. The writer of the article Tetanus, in the *Encyclopædie Médecine* mentions his having seen the warm bath in five or six or three cases in which it was expected to produce good. Through misapprehension there is committed the mind of the plan it would be difficult to come to their accuracy, nor have whilst generally more on the adoption has ever been followed by successful results. The warm bath was tried in Spain and used to produce only momentary relief.—(*Med. Clin. Trans.* vol. 6, p. 457.) Dr. Henry, who has used a long while in the warm climate of Vienna, writes, tetanus is very common, disappears of the season of treatment. He observes, that although the warm water bath may appear to be very mild, and pleasant to be used, he always found it more not serviceable than expected with an occasional exception, and he also mentions, that in his hospital many patients die the very instant when they are out of the bath, notwithstanding they had no less as it were this remedy administered, the temperature of the water being however not higher than in warm bath, the thermometer.—(*See, Mémoires de la Soc. et Mémoires de Médecine*.)

Dr. Hays also mentions similar fact of a patient dying the instant he was taken out of the warm bath.

Hyperæsthesia was an obstacle for the application of cold water to tetanic patients. The only means of the cold water was first particularly suggested by Dr. Goussier, in the *Arch. Méd. Clin.* and secondly, and the plan has subsequently received the sanction of Dr. Wright, Dr. Corrie of Liverpool, and others. As to the procedure which have been employed in cases of tetanus, the cold bath is expressed by some authors as that which has been attended with the greatest success. Dr. Wright published in the *Arch. Méd. Clin.* vol. 6, a paper containing a narrative of the last cases of this method, which were all successful. The plan would be performed throughout the Week before 2 o'clock in the morning, the patient in cold water, and in case of the way, when at hand, or poured in the water, or else in throwing from a certain height into a tub of cold water over his body. After this he was to be very carefully dried with a cloth, and put to bed, where he should pay no further account with disease, and most theory of things were to be done. The symptoms usually seen in tetanus in a human degree, but the relief which this method affords is not of long duration, and it is necessary to repeat the water immersion at the end of three or four hours. They are to be repeated in this manner till the intervals of freedom over the attacks of the disorder increase in length. This desirable end, it is said, generally were obtained, and ends in a relief. The arms and legs were sometimes collapsed with the foregoing system, and seemed to contribute to the production of the good effect. Dr. Wright concluded the account with the following remark, and to this you may refer, by the *Encyclopædie de Médecine*.—I am persuaded, that opium and the cold bath with some slight relaxation for tetanus and such like diseases, of which the system discharges the morbidities, and given more from the violent spasm, the cold bath would still have a wonderful tonic effect on the system in this and other cases. Perhaps this bath, given with more would come the more sure certain. But we cannot have failed in many cases, by using opium alone in large doses, or when probably it were, with the warm bath instead of the cold bath? And lastly we are disposed to suspect, that the increased doses of opium which were administered when the water bath failed, may have proved beneficial.—(*Vol. 6, p. 459*.)

Our next subject now we come to Spain, we said to have found the cold bath more than others.—(*Med. Clin. Trans.* vol. 6, p. 454.) and lastly I beg to remark

particularly, that the plan seems to present no hope of benefit in cases of tetanus from wounds, however strong the evidence is of its utility in other examples of the disease. This was the opinion of Hippocrates, and, in modern times, that of Dr. Cullen, Calaneo, &c. "Dantoni's saline baths before corpora in apoplexia in tetano a calidum interius vires prodere, in tetano a causa externa admodum effectum prout."—*Agrippæ Chirurgia Medica*, part 1, p. 109, 110, 111, 112. On the subject of cold effusions and bathing, there are on record two cases, which are curious. One is related by Hæm. Læmy. It was an instance of tetanus from a gunshot wound. The cold bath was used. The first two trials gave the patient extreme pain, and no improvement followed. The sight of the bath the next time filled him with an invincible dread of the water, into which he refused to be put. He was removed, however, to the bath, and remained. The tetanic stiffness was immediately increased and death followed. It became necessary to remove him directly from the bath, and put him to bed. Deglutition was from this moment entirely impeded, and the contraction of the muscles expired to the most violent degree. A trachea, about as large as an egg, suddenly made its appearance both the lower and upper lip moved. After death, this was found to be caused by a rupture of one of the recti muscles, and a consequent extravasation of blood.—(*See also*, de Clair, *Med. v. 2, p. 277–289*.) This case is decidedly in support of the truth of the statement expressed on this subject by Hippocrates, Cullen, and Calaneo. The point is not so. It is mentioned by Sir James Macgillivray, that in the march of the guards through Gallipoli, one of them was attacked with tetanus, in consequence of a slight wound of the finger. As it was impossible to think of leaving the man in the retreat of the village where he was taken ill, he was carried on a blanket car, in the rear of the division. During the last part of the day he was stretched with pain, and there was standing at 32°; but, after ascending one of the highest mountains in Galicia, the patient was taken out of bed, and he was exposed from his in the morning to ten at night, when he was found half stricken to death, and five from every symptom of tetanus.—(*See* *Med. Clin. Trans.*, vol. 2, p. 430.)

Mr. Abernethy, in his lectures, expresses his conviction that in tetanus and all nervous affections, it is a most material point to operate on the brain, through the medium of the digestive organs, and that the production of narcotics from the alimentary canal has a more beneficial effect than any other means. He particularly commends the colligation of the stomach and jejunum, mixed with opium, as a means more than any other. Where much difficulty occurs in making the patient swallow, however, potestive medicine, it would strongly recommend to the administration of picrotoxin, the (doses light), a drop of which, blended with a little mucilage, and put on the root of the tongue, will operate powerfully on the bowels.

Another remedy still is here frequently effected a cure in tetanus is mercury.—(*See* *Ann. de Med.*, p. 45.) Mergatol frictions, practiced so as to induce a quick absorption of the agent, and in an early stage of the disorder, are justified. Others contend, that it matters not whether mercury be rubbed into the body or administered. It is positively asserted that opium may be advantageously exhibited at the same time. This practice was first adopted in the West India case. (*Edinb. Medical and Literary Essays*, vol. 3, p. 149.) It is recorded in many cases. Whatever benefit, however, may have been experienced from this plan is well known, it completely fails in the same form of the disease. Mergatol frictions appeared in Hæm. Læmy to aggravate the symptoms, in the cases where the skin was laid in Egypt. (*See* *de Clair*, *Med. v. 2, p. 277*); and Dr. Esmar, Mr. Guthrie, and other special officers attached to our army in the Peninsula, tried injections of the whole body, three times a day, with strong mercurial solution in oil administered, with no degree of success. After the battle of Trafalgar, a fatal case even occurred in a man, strongly affected by the influence of mercury, which he had been previously using for the cure of the itch.—(*See* *J. Macgillivray*, in *Med. Clin. Trans.*, vol. 5, p. 434.) The superiority of mercury, combined with picrotoxin, also proved its effectiveness in actual cases; but in chronic cases it proved abortive by keeping upon the bowels.

Another method of treating tetanus is that of administering the most powerful acids and stimulants, such as wine, brandy, ether, preparations of ammonia, bark, creosote, &c. The introduction of this plan was chiefly owing to the instance Dr. Rush, Professor of Medicine in Philadelphia, who published in the *Transactions of the American Philosophical Society*, vol. 2, a paper entitled "On the Cause and Cure of Tetanus." Dr. Rush considers tetanus as a disease essentially connected with debility, and he recommends for it the exhibition of the preceding class of remedies. He particularly advises the strong use of wine and Potassia lixiv; and as we have already stated, when tetanus comes from a wound, as directed the direction of it, and drops with oil of turpentine. Considerable success is mentioned as having attended the practice. Several other instances of success are also recorded by Dr. Huxham.—(*American Medical Repository*, vol. 2.)

Dr. Cullen, considering scorbutus, paralytic, apoplexy, chorea, and tetanus to be "affections of the nerves, or of those parts of the brain and spinal marrow which are immediately connected with them," was induced to try the effect of subcutaneous of iron (active examples of tetanic tetanus, in consequence of the success with which it had been exhibited in the other complaints above specified. Confinement to bed, with giving 5*ss*. of the iron, combined with, followed, when required, by the oil of olive. The quantity of this iron given in large fringed doses of 2*ss*, and given half an ounce, every two hours. It was mixed with wine in quantity of brandy, and blended with strong licorice. Two of the cases recovered; the third, which was one where the spasm was excessively violent, and the patient 148, was too rigid in its progress for an efficient trial of the remedy, the patient dying the day after the commencement of the plan.—(*See* *Med. Clin. Trans.*, vol. 15, p. 165, &c.) As tetanic tetanus has been occasionally cured under a variety of plans of treatment, it is difficult to draw any certain inference respecting the real utility of the exhibition of iron in that disorder, from the two examples of recovery published by Dr. Cullen.

Nothing is more certain proof of our not being acquainted with any very efficient method of treating a disease than a multiplicity of remedies which are as opposite in possible in their effects. We have seen that the contention Dr. Rush conceived, that tetanus was a disease connected with debility; and he has recorded examples in which it was successfully treated by acids and stimulants. Extraordinary, however, as it may appear, many practitioners are advocates for opium, especially in the early stage of tetanus. Dr. Dickson thinks that for a full trial, where the wound is healed, followed, and patient, sometimes, with free purging and such other topics as are calculated to allay the general and local irritation, affords the best chance of removing the danger.—(*See* *Med. Clin. Trans.*, vol. 2, part 3.) Harvey has also published several cases in which bleeding had a good effect. We are informed by Dr. James Macgillivray, that at our military hospitals in Spain sometimes had a few trials. In three cases at St. Andrea, decided by Dr. Galtier, this was the principal remedy. One patient with tetanus, from a wound of the back part of the hand, was died nearly of cholera several times with good effect, calomel and diaphoretic being also given, and he recovered. Another patient was laid in the same manner with such success, that he suffered but little from opium, and could open his mouth very well when he was mixed with doctored, which in his delirious state, caused him to do. In the third case, which was one of acute tetanus, symptoms, pointed to the throat, totally failed.—(*Opusc.*, vol. 2, p. 455–462.)

The powerful relaxing effects of tobacco chylers, in cases of tetanus and convulsions, have suggested a trial of them in tetanus. In one very acute case, the plan was tried by Mr. Keble, but it only afforded a temporary alleviation of the spasm, and so it called to more attention, it was discontinued. According to Sir James Macgillivray, tobacco chylers tried in the advanced stage of the disease seemed to have no effect. He considers, however, the tobacco fume as deserving to be tried.

A remarkable case is recorded by Dr. Phillips, in which the jaw suddenly fell upon the volubility of an acute attack of tetanus.—(*See* *Med. Clin. Trans.*, vol. 6, p. 50.)

by the side of the trachea, and even a little time afterwards this it. However, as these vessels proceed up the neck, they become more liberally supplied with respect to the trachea; and when they have arrived at the upper part of the neck, where persons who die at a death almost always die, they become situated more backwards than the trachea, including inside the angle of the lower jaw.

The esophagus is so deeply situated, lying close to the sides of the trachea, and behind the larynx, that it is not often concerned in any internal wounds, which do not immediately prove fatal, as consequence of the division of other important parts. Yet numerous cases are recorded in which the esophagus is said to have been wounded; and what is usually set down as a trifling accident, is the passage of victuals through the wound. In many of these instances, the writers seem to have forgotten that wounds made above the epipharynx, as they frequently lay very close to the neck, and the victuals escape through the cut, without the esophageal pharynx being in any danger.

However, as death the esophagus has occasionally been wounded, together with the trachea, not only without the patient perishing immediately so as to be incapable of receiving any support, but without every chance of recovery being destroyed. Scars and gunshot wounds may injure the esophagus, and leave all other important parts untouched. Nay, when other parts of the esophagus are injured, the patient is sometimes saved.—See *Hunter's Military Surgery*, p. 20, et. 2.

Even when the esophagus is known to be wounded, the deep situation would prohibit us from doing any thing to the breach of continuity in the tube itself. The best plan would be to have recourse to esophageal means, and to introduce a double canula catheter, from one of the wounds down the esophagus, for the purpose of conveying nourishment and medicines into the stomach, without any risk of their passing out at the wound. An instrument of this kind will be in the above situation for any length of time without producing much inconvenience, and besides being necessary for supplying nourishment and medicine down the passage, and keeping them from coming at the wound, it prevents all necessity for the wounded esophagus to set, and become disturbed, which more is seldom in any kind of lipids, especially in the way of nutrition or food. The outer wound should be brought together and treated on ordinary principles.

When persons cut their throats as I have explained, they do not often divide the carotid artery, owing to their incision being usually made high up in the neck, and this vessel has attained a very backward situation. When any serious hemorrhage does arise, it is sometimes from the lower branches of the thyroid artery, this most frequently from the superior thyroid artery. These arteries only causing a fatal bleeding, which, indeed, would more frequently be the event were it not so, it did not the patient often find, in such case the bleeding spontaneously ceases, and ceases for the arrival of surgical assistance.

I need hardly tell the reader that these vessels are to be tied, and that this important object is the first to which the surgeon should direct his attention. The chance of bleeding to death being obtained as soon as possible, the other surgical measures may be more deliberately executed.

With respect to wounds of the trachea, the prospects of conveying food and medicines into the stomach through an elastic tube, catheter, introduced from one of the wounds down the trachea is highly perilous, though too much neglected; for nothing tends so much to diminish of the natural action, as the inevitable division and exposure of the larynx and trachea, which are usually situated on the way of swallowing.

When the trachea is cut, the patient's power of forcing the air is more or less impaired, in consequence of the air passing into and out of the lungs chiefly through the wound. Besides this, a considerable quantity of the natural mucus of the trachea is also continually coming out of the wound.

The great means of accomplishing the union of wounds of the trachea, are a proper position of the head, and a supine situation of the patient. Bringing the patient's head with pillow, and keeping

his chin close to his breast, the edge of the wound ends inside skin and trachea, are placed in contact even without any other assistance, unless the diameter of the trachea be exceedingly large. It is proper, however, to procure the effect of a suitable position with strips of sticking plaster, and sometimes to fix a suture or two. But the severity for suture wound position on the extent of the diameter of the trachea; for almost most of the circle of this tube is cut, and position is neglected, the wound in it will not gape. The trachea should never be passed through the living of the trachea, as this method would be likely to make it adhere, and occasion considerable coughing and inflammation, attended with very pernicious effects.

Should there be great coughing, apparently arising from irritation and inflammation of the trachea, according to proper, if other considerations do not forbid it. The external trachea with often is also frequently of great service. It rarely acts a wound of the trachea made by the ligament.

[That wounds of the trachea do unite by the first intention would seem to be rendered probable, at least, by the easy recovery of patients after the operation of tracheotomy. This operation is now very frequently performed in this country, for the removal of foreign bodies from the trachea and sometimes for anastomosis or repair. Indeed I have known it inserted in difficulty in phthisis trachealis, but without benefit. The case however is sufficiently established, that the operation is seldom followed by any troublesome symptoms, and the trachea does unite in a very few days.]

In this operation it is true that the trachea is often perpendicular only, and the patient remains in such a way necessary, while in wounds of the throat as in attempted stitches, the trachea is generally wounded across its radius or between the rings. I sometimes seeing one of the trachea (which a man cut his throat with a razor, and divided the trachea entirely across and yet it united again by the treatment recommended by Mr. Cooper, and in a few weeks in voice and respiration had entirely recovered. We should always make the attempt, as he advised, and with very generally be successful.—*Doyle*]

See *John Hall on Wounds*, et. 3. *Hunter's Military Surgery*, p. 206, et. 2. *See* *Edin. 1820*. Among other references made by Dr. Hunter, the following may be of use to merit particular notice.—An interesting case of wound of the neck, attended by hemiplegia, and rupture of the trachea, is given by *Dr. Ferrius* in his *Surgical Observations*. Another with loss of motion in the arm, from a wound in the neck, is to be found in the *Edin. Med. Essays*, vol. 3. And in the *Med. Commentaries*, by Dr. Duguid, vol. 4, p. 634, and vol. 8, p. 256, are two interesting cases. *Montana*, in his *Med. Chir. Bibliotheca*, relates a case of removal of the thyroid gland by a common cut; the patient survived fourteen days, and died of hemorrhage. Wounds of the trachea often remain open for considerable periods, as is illustrated in a case reported by *Travers*, in his *Præsentation Observations*, Sept. 1745, p. 49. Mr. Ferrius has recorded an interesting case of wound of the trachea, in *Med. Chir. Journ.* vol. 1, p. 289. I would also refer to various parts of *Alm. de Chir. Milit.* by *Baron Larrey*; and *Thompson's Report of Chir. made in the Hospital de Edinburg*, *See* *Edin. 1820*.

THROMBOSIS. (*Edin. Solis*, coagulated blood.) A clot of blood. The term is also applied to a tumour, formed by a collection of extravasated coagulated blood, under the integuments after bleeding. When not considerable it is usually called an *æchymosis*—(see this word and *Ecchymosis*.)

A thrombus after bleeding generally arises from the opening in the vein not corresponding to that in the skin. The patient's throwing the position of the arm, before the blood is flowing into the vein, will often cause an obstruction in the escape of the blood from the external orifice of the pulsation; and consequently an increase itself into the cellular substance in the vicinity of the opening in the vein. In proportion as the blood issues from the vessel, it is effused in the cellular substance, between the skin and fibres, clashing the muscles; and this with more or less rapidity, and in a greater or less quantity, according to the colour of the skin more or less purple the outward cause of the thrombus. Sometimes, also, a thrombus forms

arteries, for the most part as large as the radial or digital, that is, in order to prevent further loss of blood, he directed us to tie the line at the swelling, and then cut away the ligament nearest the ligature. For this purpose he used a blunt-pointed mucousoidal needle, armed with two four-threaded ligatures. This was passed through the middle of the tumor, which the fingers were pulled upward, and was ligatured with three gradually tied over the tumor, and thereafter over the upper half of the tumor. For the sake of being still more sure of compressing the hemorrhage, M. Moreau also applied a third ligature all round the swelling, and he then re-estimated the dissected place, without any bleeding from the part incised at the ligature. These were now fastened at the sides of the wound with adhesive plaster. The whole surface of the wound was sprinkled with powdered pine resin, over which was laid again, wet with Tindal's vaseline ointment. These applications having been covered with stapes, the lips of the wound were drawn towards each other with adhesive plaster, which was also covered with ointment, wet with vaseline, and renewed every six or eight inches.

It is quite unnecessary for us to follow the narrative of this case in all its details. The patient, between the period of the operation and that of his cure, suffered a most kind of convalescence, which at first slowly consisted of difficult deglutition, severe pain all over the right side of the head, together with of the arm, frequent rigors, and fevers. In the afternoon blood began to flow through the ligature, and, as the bleeding had not ceased when an hour's pressure with the hand the dressings were removed, and the blood found to proceed not from any particular artery, but from all the wounded surface. The wound was again sprinkled with pine resin, which was covered with stapes, and a bandage; two sanguine scars also directed to keep up pressure with moderate. The day after the operation the febrile symptoms rose high, but in two days subsided again. On the eighth day all the ligatures came away, even that which had secured the tumor, and a large quantity of fresh matter was discharged. Soon afterward a considerable fetid matter, which however was mixed with grunge and some powder. On the 16th day another serious hemorrhage was occasioned by a catarrhal touch, and life was endangered by the loss of not less than two pounds of blood. The bleeding which came from the upper angle of the wound was stopped by means of a piece of sponge dipped in rectified spirit, and covering the wound and dressed the whole neck with compresses wet with vinegar, pressure being also kept up on the sponge with the hand. The dangerous state of the patient may be conceived when it is known, that there was now a deadly paleness of his whole body, languid eyes, dimness of vision, loss of hearing and speech, and extreme prostration of the vital powers. With the aid of judicious treatment, however, he rallied, and in the end left the hospital quite cured.

In another case reported upon by M. Moreau, the dissection was even easier, owing to the extensibility of a portion of the distal lobe of the thyroid gland. It fell back in the transverse processes of the cervical spine; but, after the third day from the operation, the progress to recovery was not interrupted by any bleeding. (See *Graville's Journ.* t. 2, p. 227, &c. or the *Quarterly Journ. of French Med.* N. 19.)

There can be no doubt, that the method adopted by M. Moreau was well calculated to obviate the great source of hemorrhagic danger, viz. the *Arteria*. As long as it was possible he took up every vessel which he exposed or divided; and when this plan could not be continued, he tied the base of the tumor or he detached the enlarged gland from the larynx. This tying of the base of the swelling, though sometimes practised on other occasions, as in the removal of diseased uterine glands, constitutes the chief peculiarity of M. Moreau's method.

A case has been published in which Kluge removed a very large thyroid gland. The patient, a boy, eleven years of age, died on the operating table. (See *Journ. des Chir. & P.* p. 120, *Ann. Berlin*, 1829; or the *Quarterly Journ. of Foreign Medicine*, vol. 5, p. 391.) On the whole, I consider the practice of tying the thyroid arteries is generally a valuable measure, than the removal of the enlarged gland with a knife. (See *Moniteur*, 26.4, Jan. 44, p. 383.) But now that the efficacy of the preparation of iodine, in such cases of

hemorrhoids has been fully proved, it is to be hoped that few cases will present themselves in which either hemorrhoid will be absolutely necessary.

TIC DOULOUREUX. This term is used to signify a disorder, the most prominent character of which consists in severe attacks of pain, affecting the nerves of the face; most frequently the filaments of that branch of the fifth pair which comes out of the lateral oblique foramen; but sometimes the other branches of the fifth pair, and occasionally the opposite filaments of the opposite side of the sensory nerve, which are distributed upon the face. The complaint is not constant, but occurs by violent paroxysms, which away is denominated in different instances. It is the *neuritis dolorifica* of Sauvages; the *facies nervosa nervosa* of Dr. S. Forster; and of that order of diseases which Professor Cuvier has to apply denominated *neuritis* (from *neur*, a nerve, and *itis*, pain); for it should be known that many other parts of the body are subject to a similar affection.

The first accurate description of the disorder was published in the year 1774, by the late Dr. Ponsingh. (See *Med. Opin. and Essay*, vol. 3.) It is not now, however, as is generally stated, that he was the first author who noticed the complaint. This, indeed, is an error being correct, that he even had an account of an epidemic disease long ago by Lentin, for the relief of the disease (see *Ann. 26 de la Faculté de Médecine*, 1706); and this identical case actually became a subject of hot dispute between the physicians and surgeons of the English metropolis. (See a *Thesis*, entitled "De *affectione paresthetica capitis faciei dolorifica attingente partem oculi maxillarem nervi quinti parvi*," &c. by Professor Follard, 1766, *medicæ jurisprudentiæ*.)

The disorder is occasionally a kind of being divided into four species, called by the French *facies nervosa*, *sub-oculorum*, and *neuritis*, and *neuritis*, and the *neuritis* of the *facies nervosa*.

In the *facies nervosa* the pain usually begins in the distance of the supra-orbital foramen, extending at first along the branches and ramifications of the frontal nerve, distributed in the soft parts upon the forehead, and afterwards descends in the direction of the trunk of the nerve towards the bottom of the orbit. In a more advanced stage, the conjunctiva, and all the surface of the eye participate in the effects of the disorder, and become affected with chronic inflammation, which is denominated as a particular species of ophthalmia. At length the pain passes beyond the distribution of the branches of the frontal nerve, and affects all the corresponding side of the face and head. It becomes if it extended itself to the facial, sub-oculorum, maxillary, and even to the temporal and occipital nerves, through the communications, naturally existing between the branches of all those portions of sensation. Each year pain produces a spasmodic contraction of the eyelids, and a copious effusion of tears.

The sub-oculorum neuritis is first felt about the sub-oculorum foramen. The seat is probably in the nerve of this name, and the pain extends to the lower eyelid, the inner canthus of the eye, the space about the eyebrow, the brow-ridge, cheek in general, ala of the nose, and the upper lip. At a later period, the pain appears to extend backwards to the trunk of the nerve, and those branches which give off it in its passage through the sub-oculorum canal. Hence, pains are then experienced in the upper teeth, the zygomatic fossa, the palate, tongue, and within the cavity of the nose. As the disorder advances, it may extend, like other neuritis of the face, to all the branches of the head. Distant paroxysms, when the disease is fully formed, are abundant, and usually takes place. In general, the strongest toothache denotes the proclivity, when, in the head, the pain arises from another cause, namely extracts several of the teeth.

The distribution of the lower jaw or maxillary neuritis, is usually first felt about the separation of the anterior surface of the maxilla superior, and it extends to the lower lip, chin, neck, teeth, and temple. This form of the complaint is more common than the preceding; but when it has prevailed some time, it is equally formidable for its intensity.

With respect to the neuritis of the facial nerve or points due to the sensory nerve, it is a case which very soon gives rise to the disorder called from the other species of the disorder. The pain is in an early period are no longer confined to the passage of the principal

branching of this nerve between the parotid gland and taste of the jaw. The tuberosity communicates with the pith of the tooth with the rest of the nerves of the face seem to lackling the extremities of the dentate, so that the ligum is soon felt over the whole side of the head. The original source of the dentals can only be detected by carefully considering the progress of the compound in all its stages.—*See* *Dental, Treatise des Maladies Vegetatives Chirurgicales*, t. 3, sect. 7, p. 224, &c.

The disorders may be known from their origin by the personality being attacked by the slightest touch, by the excitement of the circulations, and the extreme violence of the pain. In acute rheumatism, also, there is fever, with redness, heat, and generally some degree of swelling; and in chronic rheumatism the pain is tedious, long continued, and often increased at night; some of which symptoms characterize the disorders.

It may easily be distinguished from leucostoma by the pink color of the margins of the branches of the affected nerve.

It is known from the experience by the comparative diagnosis of the pneumonias, the quickness of their appearance, the intervals of entire ease, the starting of the pain in the breast of the pleural nerve affected (the nervous period) and the exciting kind of pain, and the control of everything which was taken accordingly the course.

3 The causes of the discharges may be said to be in general unknown; but at least a few instances are recorded, which appear to be the consequence of external violence, wounds, contusions, &c. It is supposed in case of the breasts, that distant irritations, especially of the spermathecae, either produce this disease, and that Sir M. Baillou has met with instances where the discharge of portions of disorganized bone, even from a distant part, has cured the complaint.—*Med. Chirurgica*, Vol. 3, cas. 25. The difficulty of placing implicit reliance on such observations depends on the fact, that disorders frequently exist together in different parts, without having any kind of connection with each other, and becoming curable in isolation.

A modern writer has related a very curious instance of a contagious disease in thrush, where the infection proceeded from the judicious use of a small bit of sugar in the usual way. (*Denmark*, in *Med. Cur. Trans.*, vol. 4, p. 85.) Dr. Perry announced the case in increased virulence, or the transmission of blood (perhaps accounting for its malignancy) in the insertion of various speciousnesses, etymology of the native affluents, (*Annals of Philadelphia and Tennessee*).

Mr. A. Cooper states, however, in his lectures, that the worms in this disease are certainly not in an advanced state; they are larvæ of their natural colour, and seldom encased than encysted. The latter fact was contradicted in a dissection made by Mr. Thomas. An occasional dissection of the worm is composed of larvae, Dupont, &c., but whether from dissection or actual observation I am uncertain.

Stimulating, invigorating, Diuretic, cardiac tonic, respiration, healthy, friction with essential oil of spruce (Edinb. Med. and Surg. Journ. and N. J. electricity, opium in large dose, the anæsthetic solution, and a variety of antispasmodic medicines, are the principal means which have been tried; but for the most part, they only afford partial and temporary relief. Lascaris has reported two cases which were cured by bath joined with opium and sulphate of ether, and two other examples which yielded to pain composed of the extract of hyoscyamus, valerian, and peroxide of zinc.—*Lancet* (Lond. Gaz. Medica 1842, 20, 64, 164, 171). The Indians, too, often have tried and often failed. Two cases, in which it answered in doses of two grains at a time, three and a half, were lately published by Mr. Thompson of Winchester.—*Brit. Land. Med. Repository* for July, 1822. M. Paraguet cured a prostration of the lower extremities, with the sulphate of quinine, in graduated doses, were directed with occasional doses of orange-flower water and spirits, and when in due doses, the medicine being continued after dinner or evening doses for a short time. M. Dupré has also published various observations respecting the use of plants of yarrow as a very powerful remedy for rheumatism in the viscera: *Lancet*. The goodness of Dr. Raley is also in favour of magnesia, and his opinion is backed by two cases in which he tried the medicine with success.—*See Thompson's Journ. of Physic*.

[illegible]

In 1901 Mr. R. Hutchinson published some essays tending to prove that the schoolmaster in his life is done of 1/10, or 1/1, two or three times a day, it being as harden remedy for his discomfort. In fact, the estimate of opinion be accepted, the teacher is a person whose more repugnance than any kind he is comes to this complaint. It is highly endorsed by Sir A. Cooper in his lectures. Yet, as we saw, in some, a shared critic noted all the pains with distinct; in all the cases, he says, the first year that in 1/10, or 1/1, three times a day, he comes. The teacher, indeed, when exposed to the pains, he was more than slightly relieved. This, as he notes, is in itself almost a proof of the condition being very hard, but when we find that Mr. Hutchinson's remedy (which he says is to be taken off immediately when the attacks to the schoolmaster is commenced in the day, and outside the school, purgatives and of course likely to debilitate the nervous system, we may somewhat doubt the role efficacy of this in a more serious case. But we see, that the nature of these would yield in less time to the plain common sense of Mr. Alverth's by sending the teacher, paid without treatment, calculated to relieve the inflammation which in most cases, he says, usually affects the nerves themselves. (See *Ed. Intelligencer* for 1881, p. 472). The latter suggestion, however, is rather unusual to what is now commonly known.

The strongest fact in favor of the real efficacy of an ablation of nerves, is evidenced by the fact, that a severe case was benefited soon after the operation, but by accident, the subcutaneous plexus was thus gone. Six days, during which the spasms occurred with their usual violence and frequency, had when the tract was given again, the good effect rapidly reappeared from it obtained.—*See Med. and Surg. Journ. for Feb. 1823.*

The operation of dividing the trunk of the uterine artery, and even of disconnecting a portion of it, so as to prevent subsistence of a longer source of vessels at the ends of the artery, is a plan which has sometimes been combined with permanent bleeds. Thus, one case of the three instances of the EVA part of uterine artery, divided at the point where it joined the trunk of the face. But before having recourse to this means, the Surgeon should be sure that the previous means which he is about to employ and divide is really the principal part of the disease; for when of an extensive of the face generally are affected, or when the branches of the plexus differ, the operation is unavailing. In a few cases, however, it has been successful. In fact, it must be observed, that the operation has had many failures and triumphs; either from the cases not having been truly considered, or from the surgeon not having a perfect idea of an exposed vessel. Richerand, Delpech, and even of an leading surgeons in France, express their preference to the application of the mode in passing, which, they say, gives more frequently successful results than the EVA. This should be done directly over the uterine artery, which the artery crosses in the substance of the clitoris, and Richerand asserts, that he has a bleeding the pulse may always be found, or at all events rendered supportable.—*Narrative, Chap. I. §. 4. p. 106, 107.*

Delpech also affirms that the method of the artery very often fails, and that hence and the symptoms of the catarrh have been attended with the most serious.—*See French Med. Jour., 2, p. 215.*

The displacement of the os uterine by burning, and thus being, however, by very objectionable. And yet, still there is no positive evidence of the efficacy of this method over the use of the knife. I consider, still, Colver and Delpech have acted only in great ignorance of the extreme partiality of the French surgeons to the probe, and cauterization. Delpech did, however, observe, that when the probe went into the consequence of a disease or inflammation, it was

Bichat describes the following as being the common plan: the tongue is vigorously moved very widely and depressed the tongue with any flat instrument, which is to be held by its anterior end. The operation is then to take hold of the diseased tonsil with a forceps, and with a narrow scalpel, having the blade full on the whole covered with rap, he now seizes it as a point of the tonsil is caught to be taken away. In removing it, it is depressed sufficient to cut as a line without injury of the tonsil (prolongation paid). Any other motion, tearing instead, should not be taken away. The operation being finished, the patient is frequently to wash his mouth with proper gargles.

The preceding method has been adopted by Broust. However, one objection is urged against it, viz. that when the end of the knife is conveyed far into the mouth it may be mistaken, not (as has been alleged) for the internal maxillary artery, the backward situation of which completely keeps it out of all danger of being wounded, but to the membraneous covering of the palate is a pitfall not corresponding to the knife. Dever thought this objection was the more feasible, as when the knife is introduced into the mouth, the danger of the above mistake is considerably increased for a general reason, which seems to affect every part of the mouth. Hence, that eminent surgeon used to employ, for the removal of diseased tonsils, an instrument which was first invented for dividing cysts of the bladder. It consisted of a sweeping blade, which was included in a silver sheath. The latter had at its extremity a kind of notch, in which the point about to be withdrawn was secured. The rest of the instruments were similar to those previously used. Dever's procedure is as follows:

1. The patient being seated on a high chair, with his head supported on an assistant's breast, he is to open his mouth very wide, and the lower jaw also be kept thus depressed by some solid body placed between the teeth, and held there by an assistant.

2. The tongue is to be kept down with a broad spatula.

3. The surgeon is next to take hold of the tonsil with a double hook, with which he is to raise and draw it a little towards him. He is then to take the above cysticoid and put the notch in the point as a level with the parts where the incision is intended to be made.

4. When the portion which is to be cut off is engaged in the notch, the operator is to draw the point towards him as far as it can go, and press the double hook against the tonsil below it. The knife being next pushed against the tonsil, the necessary section is accomplished. When the division is accomplished, which is painful, but liable to happen when the diseased gland is of considerable magnitude, the blade is to be drawn back, and the wound is completed by applying the instrument to the second which it has already made. Substituting even a good operation may possibly become requisite.

5. The patient is to be directed to wash his mouth. Bichat states, that this plan of operating, adopted by Dever, is as simple and easy as the method above related, with the advantage of being safe. Such is the construction of the blade of the instrument, that when it enters into the mouth it presses against, and steadily holds, the parts which are to be divided, an advantage which enables the knife to remove safely, under the action of which the parts are quite safe. Hence, there is difficulty in carrying them. When the introduction of the instrument from above downwards is difficult, it is better to withdraw it, and when turning the point in the requisite direction, pass it from below upwards. In general, however, the first of these methods is preferable, because the gland, when half cut through, cannot now get back and obstruct the view, thus, as to being on danger of a sudden suffocation; a circumstance which Whiston and Mercat saw happen. With the view of preventing this occurrence, Lewis recommended the common scalpel to be used, with its edge directed upwards, as has been advised for the above instrument; which little contrivance, however, being according to his own account, next easy and safe, meets the purpose. Besides the advantage of being cut with parts which are to be cut, it has that of not confining them, like moderate instruments of this nature, as, for instance, Wilson's; and the oblique disposition of its blade enables it to divide even in the manner of a saw.

This instrument, as Bichat shows, is certainly improving the number of surgical instruments, a thing which all the best modern surgeons endeavor to avoid. But it is to be recollected, that this instrument is not exclusively applicable to any particular operation. It may be employed for cutting away the tonsils and the tongue during operations done in the pharynx, larynx, and trachea; and, in various other circumstances, parts of the case of this mode of introducing some other instrument, and various methods in which it is used are deeply influenced in different cases, as the body, unless instruments introduced separately might injure parts which should be avoided, or where the bone of the base of the skull is to be removed, or where it is to be accomplished. The latter object cannot easily be effected by means. When the bone of the base of the skull is to be removed in the neck, one part is due to be divided, and then another, all as which is done in the neck.

In England, when a diseased tonsil is to be cut away, surgeons generally prefer a common scalpel.

As a general practice, I consider that the removal of an enlarged tonsil is a better practice than the extirpation of it with a ligature, which also sometimes happens very well, and, perhaps, in children, and small patients, may merit the preference. The chief reasons for the ligature are, that in operation is rather tedious, sometimes productive of a great deal of hemorrhage, and on the whole as painful as the knife.

Moreau having once adopted this plan, very severe pain and inflammation ensued; the difficulty of swallowing and breathing compelled him to suspend the operation at the place where the ligature was applied, and all the bad symptoms immediately ceased. Besides, when the ligature is used, there is no cutting of blood from the vessels, a circumstance which tends so much to diminish the inflammation. The loss of the swelling is also sometimes greater than its upper part, and does not admit of being properly surrounded with a ligature. And when it has a narrow base, it can then be so easily removed with a scalpel, or with Dever's instrument, and with so little pain, that one of the last modes is generally preferred.

The ligature, however, has had its advocates. Hunter considered it inevitable cause. Sharp praised it, and others approve of it; and the plan of employing it has been various in the inventive genius of the different practitioners of the practice. Some resemble of Lenoir's double cascade, which is furnished with a silver wire, in which the tonsil is to be engaged. By twisting the instrument, the diseased part becomes constricted. Some, after passing the wire of a ligature over a kind of instrument, take hold of the lower part, push the ligature over the enlarged part, which they fix, without having any means of increasing the constriction afterward. Others employ Dever's instrument for getting the ligature over the tonsil. Still, Cooper, who prefers the pedicle, carry, and then passes the ligature with it behind the enlarged tonsil. The pedicle being then removed, the knot is made with care, so that the ligature is not long enough for the purpose.

Moreau employed an instrument which the French call an *entrouvert*, which is in fact nothing more than a long, narrow, round piece of silver, terminating at one end in a little ring or hole, and at the other in a kind of grooved mouth.

1. The patient was seated on a high chair as in the first method, with his head supported on an assistant's breast; his mouth was opened very wide, the tongue depressed, and the diseased tonsil taken hold of with a double hook.

2. The surgeon took the *entrouvert*, in which the ligature had been passed, so as to form a noose. The noose was put over the tonsil after the hook, which was continued to the charge of an assistant, and the noose was pushed over the tonsil so as to embrace it completely.

3. The surgeon now drew the ligature strongly towards him, and pushed forward the *entrouvert*, so as to produce the requisite constriction of the tonsil. In general the ligature was not made very tight the first day.

4. When the necessary constriction had been made, the double hook was withdrawn, and the ligature twisted round the tonsil as the twisted end of the double hook.

the best English surgeons; but several cases have been proposed, as, for instance, the tripod elevator; and another invented by J. L. Petit, and afterward improved by M. Louis.

Before beginning the description of the operation, I think it highly proper to remind the reader of what has been so fully described upon the same point, *namely*, of that property by which the water is of pressure of the brain, which pressure must also gradually increase, and which pressure, as the brain is displaced and visible, is the reason for employing the trephine, or, in other words, for removing the skull. There are very few exceptions to this remark. It may, indeed, be said, and then proceed to show away the bony edges around some fungus or some tumor which grows from the dura mater, and under these may certainly be occasioned an absorption of the part of the skull immediately over them.—(*See Davis's Memoirs*). It may also be maintained proper to saw out diseased portions of the skull, though it must be confessed, that in general their absorption should be left to time and nature. Some operations should always be reserved, and, perhaps, if the depressed portion of bone be situated in a wound of the scalp, a mind to raise it with the elevator will be proper, even though urgent symptoms of pressure may exist. In such a case, Sir A. Cooper sanctions the application of the trephine (*Lectures*, vol. 1, p. 241); but it is contrary to the principle which I conceive ought generally here to be our guide.

It is true, that suppuration of the dura mater may follow in such a case; but I do not believe that trephining would tend to prevent it, or, in fact, to prevent it from occurring in antiphlogistic measures; and thus we should only proceed to relieve bone, when the symptoms indicate the enlargement of matter under it, or, in other words, effects from the enlargement of a depression that is the first instance, perhaps, produced in antiphlogistic measures. On this point, however, I deem it but to mention, that Mr. Leslie coincides with Sir Astley Cooper, and lays down the following general rule: that if the depression be supposed to be consequence of a wound of the scalp, let the surgeon apply antiphlogistics, and afterwards decompress; but if there be a depression without a wound of the scalp, it is consequence of the accident, let him not make such a wound by an operation.—(*See Med. Chir. Trans.* vol. 14, p. 403.)

In the records of surgery, innumerable facts may be collected, where the patient and judicious employment of the trephine has effected wonderful cures, and been the only thing by which the patient's life could possibly have been saved. The benefit which the operation brings about is also sometimes so sudden and astonishing, that in no instance does the intervention of the trephine not display itself to greater advantage. The immediate restoration of sight by the depression or extraction of an opaque substance from the eye, is not less wonderful and striking than the instantaneous communication of the intellectual faculties, and of the powers of speech, of feeling, &c., together with voluntary motion, to a person lying in an apparently lifeless state from an injury of the head. The utility of the trephine is occasionally manifested even in this degree. In the valuable essay of Mr. Abernethy on injuries of the head, a case may be seen in which the patient, who had been in a condition almost bordering on senseless, rose up and spoke the instant the extravasated blood was removed from the surface of the brain. And among the wounded at the battle of Waterloo, there was a soldier of the 44th regiment, whose case if of equal interest. He had been struck by a musket-ball on the right parietal bone, which was exposed, but had no appearance of being fractured. At, however, the symptoms of compression were urgent, and the patient was in a state of insensibility. I succeeded it, right to apply the trephine on the part on which the violence had acted. I had not saved long before the cerebral table came away in the hollow of the trephine, leaving the inner table behind, which was not only unfractured, but driven at one point more than half an inch into the meninges and substance of the brain. No sooner were the fragments taken out with a pencil, except, than the man instantly set up in his bed, looked around, and began to speak with me almost rapturously. It is a most extraordinary fact, that this patient got up and dressed himself the same day, without leaving the medical officers, and never had a

bad symptom afterward. Immediately the operation was finished the temporal arteries were exposed, and some purgative medicines exhibited.

Mr. Bristle has seen a case in which there was a fracture with distinct depression of the inner table, with there was a simple fracture, which was easily perceptible, and that without the smallest depression of the water table. He also adverts to the necessity of the trephine, in which there were extensive fractures of the inner table, although the outer was not fractured, and, in fact, not fractured, as stated by Pott, in which, while the outer table was under the hammer, the inner table was broken into splinters, some of which were actually driven into the substance of the brain. As a further proof of the necessity of the trephine, it is mentioned, that the outer table is always broken in a greater extent than the inner one; and the actual depression greater than would appear from the same inspection of the external fracture. These arguments are not disputed in the greater elasticity of the outer table, and greater brittleness of the inner.—(*Med. et Chir. Trans.* vol. 14, p. 200.)

In a case of fracture of the dura mater, with running hole, mentioned by Schneider, the trephine was applied eleven times in less than 24 hours, and the operation used to cause no little indisposition, and the patient hardly ever required to go to bed at night, but on one occasion actually went to bed, and was able to perform his duty.—(*Wandelaar's*, vol. 1, p. 46.)

Let not the young surgeon, however, learn from a few dazzling examples of success, as thousands are able to perform the operation, for it should seem to be a mistake. It is the most painful operation, and when the symptoms themselves show that a dangerous degree of pressure on the brain exists, I consider an unfortunate example, in which the late Mr. Thompson, of St. Bartholomew's, a physician, ventured to saw on a portion of the frontal bone in a young, well-constituted man in the parietal; the patient was seized with convulsions of the face, mouth, and part of the spine, and died in a few days. Two analogous cases of fracture of the bone, with similar fatal results, are also mentioned by Mr. Keble.—(*See Med. Chir. Trans.* vol. 14, p. 201.) That the trephine is not a cure, some risk of a subsequent operation, and absorption of the dura mater, and growth of the bone, is now a fact universally admitted. We may therefore conclude that the operation is not used except from danger; and is, in fact, a most useful one to be resorted to without deep consideration. "Omnis laesio cerebri est species of insanity, and total loss of intellect, without doubt, is the result."—(*Calverley's*, *Med. Chir. Review*, Nov. 1, p. 135.)

In cases of injuries of the head, the organ is exposed in a great measure, except for the purpose of relieving the brain from pressure. Such pressure may be caused by a depressed portion of the cranium, or it may be produced by an extravasation of blood, or the enlargement of matter, between the skull and the dura mater. The chief danger of compression, when the accident is not directly or soon freed from the inflammation and morbid state of the brain, depends upon the consequent inflammation of this organ, and therefore cannot be likely to be benefited by trephining. If the operation becomes proper in such a case, it is when the disease has formed under the meninges, and when the enlarged matter itself grows and is confined by a pressure on the brain. This state of things, however, cannot occur on all after the inflammation of the brain, and its symptoms have prevailed a certain time, as it is always accompanied with a disturbance of the performance, and a puffiness of the face; so that there is a removal of the latter part considered that the disease, the type of convulsions and other symptoms, is a necessary consequence and has itself been removed. The patient has also had much previous convulsions, and, after the operation, the whole head, and the face, and generally the body, is in a morbid state. When the matter is forming between the meninges, and, as soon as it is formed, the pressure is a morbid state, and paralytic symptoms soon ensue. There is the tendency for the present application of the trephine is very great, and the patient's only chance of living is almost entirely connected with the knowledge of the performance of the operation. This important case has been particularly well spent in the writings of Mr. Pott.

In the article *Head, Injury of*, I have laid down the most remarkable symptoms of contusion and compression of the brain, a subject which every surgeon should study with careful attention before he even pretends to explore the brain. The symptoms these accidents are extremely difficult to be discriminated; sometimes they exist together in the same individual, a compression which is probably self-limiting; and, in every instance, where the symptoms are those of contusion, not compression, as far from being transient, would be a step of all others the most likely to do harm, by increasing the irritation and inflammation of the brain, and its membranes. A fall upon the back or upon the head produces a direct compression of the brain, and the shock and being entirely weakened by the excitation of any violent action circulate in the more dangerous. When a person comes into a room with a terrible fall, and is found on his head, his back, his buttocks, the knees, or even the sides of the feet, when he has been severely deprived of his senses, and then by degrees recovers them and seems to himself well; the fact of his having suffered compression of the brain is clear and indisputable. Consciousness may likewise return again, though in a slighter degree, when the patient has been only struck by the fall, and experienced a concussion of spirit. But a multitude of degrees among this field emanate from that which reflects the substance of the brain is unconsciously disorganized, so that there is not the possibility of recovery.

The symptoms of compression of the brain are attended with coma, and the compression of the organ by its membranes is also accompanied with tetanic contractions. Every sign is the symptom to become, whether the symptoms denote either from either the nature of these accidents.

Here, it is to be noted, I have laid down the symptoms of the brain, already made in the above-mentioned article. And there is one criterion of such importance, that it may prove an insurmountable hindrance, and, indeed, prevent the successful collection of its signs, and to interfere with the shock and the whole part of surgery. The first symptom I shall mention is that, notwithstanding it has been already noted elsewhere, in the patient has been knocked down and passed directly by the blow, and receives it a side of sensibility, these primary symptoms are insensible to the operation. On the contrary, when the coma and loss of sense do not take place till an hour or two after the blow, they are to be regarded as a variation.

The shock given to the brain by compression, and the every other insensible communication, continue to dissipate until it ceases altogether. It is at the very time of the blow, that the shock is not less, doubtless enough to produce bleeding symptoms, such symptoms will not afford room on when their cause is weakened. Hence the reason why compression can be discriminated from contusion of the brain, when there has been an interval of time between the receipt of the blow and the occurrence of the symptoms. But the direction of the symptoms into primary and secondary must be made when contusions and extrusions arise together.

Having made these few remarks on compression and compression of the brain, matters which should be carefully before I entered into a description of the compression of the brain, I shall next present some observations relative to contusions and fractures of the skull, some of which the most extensive symptoms have been explained. It is true, that I have in many places been *Head, Injury of*, considered the subject; but it may be better to present certain points here, because they have such immediate connection with the application of the trephine.

Contusion of the head not infrequently occasions a small kind of tumor, which is not in the center, but hard and resting at the circumference, especially when the violence has been moderate. Now the case with which the tumor or seat of the contusion is that which of being depressed, while the surrounding tissue, being hard and elevated, is extremely apt to give rise to the belief, that a fracture may possibly have happened. The true nature of this accident was first clearly explained by J. J. Petit, and since his time, the proper caution not to fall into a mistake respecting it have been laid down by the practice of surgical writers.

Often nothing is more obscure, than the diagnosis, features of the cranium: their nature, indeed can only be made out with certainty when they can be felt by touch. Thus a fracture of the skull, attended with a wound of the adjacent tissues of the lower, shows itself in the form of a linear mark or low ridge and extensive, and taking various directions. The accident may also be known by the touch even when the soft parts appear entire, particularly if the fracture is accompanied with splinters, or the edges of the fissure are mutually separated. When there are many splinters, entirely detached, a trephine will likewise serve to explain the nature of the accident; but, be assisted by these symptoms, reported to him by the sight, the hearing, or the touch, the practitioner must not at once offer a decided opinion as to whether a fracture exists or not.

In order to procure more positive information, would it be right and judicious to make several incisions and remove the bone? But here the patient would be endangered in the very commencement of the procedure; for how could he be able to judge where the knife should be applied? Why also should he resort to a useless and painful operation, when to say the least of it would only render the patient's case more distant?

The symptoms indicating compression of the brain can alone justify an examination of the fracture. These symptoms also must be upon and alarming, for when they prevail to a slight degree, bleeding and evacuation prove more benefit than any operation on the skull; and consequently all examination of the part supposed to be broken must be unnecessary.

Even when the cranium has been divided, so that the sight can carry the information respecting the extent of contusion in the brain, care must be taken not to be deceived by a surface, or by the groove of a vessel. In cases of skull, a modern surgical author advised us to scrape the inside of the bone, and he tells us, that if after the removal of the external scale the fissure yet appear, and a fissure of blood be seen at its outer part, no dissection of it being it real is not. As, however, seeking this examination can numerous purposes, except to a view to determine the place where the trephine should be applied, I cannot recommend the plan, except where the symptoms are such as to render this information desirable. On the contrary, it appears to me, that all examinations of the bone, made otherwise than more curiosity, and without any true surgical object, should be deprecated as rash and harmful.

The danger of fractures of the skull does not depend upon the simple solution of continuity; it being altogether a relation to the compression and compression of the brain, with which the injury of the bone may be compared. The pressure caused by depressed splinters of bone is less alarming, inasmuch as the cause of the compression is easy of removal. The pressure of compressed fluid is far more serious, as consequence of the difficulty of ascending positively its existence and precise situation.

It is not in vain that between the skull and the dura mater, which is detached from the bone. More frequently it occurs either between the dura mater and crura mater, or in the substance of the brain, or the dura mater. The quantity of extravasated fluid is generally less in these extravasations which are situated between the dura mater and the skull, unless they be in the course of the middle meningeal artery, when they are frequently very copious. The extravasations which are formed in the substance of the brain itself are not only more considerable, but also, as they mostly depend upon compression, are more alarming, than effusions on the surface of the dura mater. It is indeed extremely difficult, if not impossible, to ascertain the situation of the extravasated fluid. In such cases, the trephine is chosen of no use, while contusion, when so violent as to produce internal extravasation, is invariably fatal. In extravasations between the dura mater and the skull, which are about the half of the case of the kind which are very soon admitted relief, when the effusion which lies under a part of the skull, accessible to the trephine, the extravasated fluid is generally, except in the instance just now specified, easily to evacuate. The danger, however, is not the least but to involve deep of fluid can sometimes enough to produce a fatal compression.

When the extravasation has happened in the substance of the brain, the compression is far more potent; in short, it may be said to press, with very few exceptions, certainly mortal.

The language, the degree of which increase from more depression into the most perfect coma; and the paralysis of the opposite side of the body to the spot of the extravasation; are the most common symptoms of this accident. Having explained elsewhere (see *Med. Legalis*, &c.) some other symptoms, such as strabismus, compression of the pupil, &c., which usually indicate pressure on the brain, it is unnecessary here to dwell upon them. The subsequent increase of the coma and paralytic affections, and the gradual diminution of their intensity, serve to render these symptoms distinguishable from others which are suddenly brought on by concussion. But there are instances, as every man of experience knows, in which continued rigidity, the fixed pupils, and profuse an extravasation of blood. In this circumstance, it is obvious that the symptoms of compression too blended with those of concussion. The symptoms proceeding from the latter cause always diminish in proportion to the time which has elapsed from the moment of the injury: while those of compression, instead, and, on the contrary, increase progressively, in proportion as the quantity of extravasated fluid becomes more considerable. Notwithstanding these distinctions, however, it need be acknowledged, that there are many cases in which the surgeon is obliged to remain in doubt with regard to the particular cause of the symptoms. This uncertainty is the more embarrassing, because the operation of the trepan is necessary in cases of extravasation, but useless in those of concussion. Even when extravasation is known to exist, the practitioner requires more information; for he ought to know the precise situation of the effused fluid. It is true, indeed, that paralysis of one side of the body generally indicates the pressure to be upon the opposite hemisphere of the brain. But this rule would venture to follow the position adopted by Van Swieten, and apply to the unoppressed side of the solid brain contents of the trepan? Possibly, not one of these could fall on the situation of the extravasated fluid. When the skull is broken, the extravasation is seldom always on the same side as the fracture. When it is, the effect of concussion, or when the location of contusion in the skull is what is termed a counterblow, the effusion is generally on the side of the head most remote from the blow. If the pressure is caused by a detachment of the internal table of the skull, the nature of the case cannot be ascertained before the operation of the trepan has been performed on the part of the skull upon which the violence has acted. When these facts are ascertained, one depending upon a fracture, and another immediately under it, between the dura mater and the skull, the case arising from contusion, and situated at some point directly opposite, either between the dura mater and the internal table, or within the substance of the brain itself, paralysis may occur on the same side as the fracture; and hence it may be inferred, that the pulse does not always take place on the side opposite to the extravasation. But, say Blackman, an extravasation of the brain quickly proves that the case does not derive from the cerebral table. This extravasation produced by concussion being almost invariably more considerable than that caused by a fracture, accounts for the extension of the pulse to the same side of the body. Sometimes the side which is not paralytic is affected with convulsions, the pulse is full and hard, and the respiration stertorous; in short, the symptoms are analogous to those caused by apoplexy.

The following observations and advice fully accord with the doctrine which I have always advocated in my writings upon this part of surgery, and they also agree with the position which was so successfully adopted by an illustrious man of the school of the Altkönig, recorded in the *Annals of Wurzburg*, as already mentioned; it is therefore with great pleasure that I quote the authority of Mr. Brodie on a point about which practitioners have been so much perplexed: "Blood corpus Mr. Brodie is seldom poured out in any considerable quantity between the dura mater and the bone, except in consequence of a laceration of the middle meningeal artery, or one of its principal branches, and it is very rare in the accident

to occur, except as a consequence of fracture. If, therefore, we find the patient lying in a state of stupor, and on examining the head we discover a fracture with a violent depression, extending to the division of the middle meningeal artery, although the existence of an extravasation on the surface of the dura mater is not thereby related to an absolute certainty, it is rendered highly probable, and the surgeon, under these circumstances, would neglect his duty if he refused to apply the trephine; and others as prudent as he, however, yet if there is other evidence of the injury having fallen on that part of the cranium nearest the middle meningeal artery is situated, the use of the trepan may be resorted to on speculation, rather than that the patient should be left in his present state, although being made for his preservation. I cannot, indeed, adduce any particular experience of the use of trepan in cases of what is here recommended; but I caution that the instances which have been recorded, in which the middle meningeal artery has been ruptured without any fracture of the bone, and the brain has then there sustained a fracture at the same time if the skull, while there is some of the same side, evidently justify such an experiment in desperate cases." (*Précis de Méd. Chir. Trans.*, vol. II, p. 265.)

With the foregoing exception, in which, indeed, a ground for suspecting the seat of the effusion must rest upon the knowledge of the point upon which the violence has operated, the craniotomy is recommended for the treatment of concussion. But, *legibus*, &c., in all that can be done with every thing is uncertain, and the operation of the trepan is, in all that can be done, it is true, in some instances where the effusion has taken place in the substance of the brain, so that it cannot possibly be evaded. The trepan then is indicated very soon, then, in an extravasation between the dura mater and the bone, the fracture being situated at a part of the skull accessible to instruments, and not at the base. Why not, then, have done upon the doubtful fracture, where we find this between the dura mater and the bone? I believe that the operation should be resorted to in a small number of cases, in which not only the nature and situation of the pressure are known, or may be suspected on the ground above explained, but in which the symptoms arising from this state are urgent and dangerous, and the pressure can be removed by no other means.

Death in the last years of his practice indicated the operation of the trepan altogether, as it seemed of the little use, having become useless. Progress of the present day trephine with more caution and discrimination, and sometimes with such success.

When the case is a simple fracture, the trepan ought to be applied upon the solution of continuity, if the symptoms indicate a dangerous degree of pressure on the brain.

When the detached portions of bone are displaced, so as to compress the brain, the operation is still necessary if they cannot be elevated by other means. The likelihood, however, that a positive benefit will be derived is not frequent, either because it is difficult to judge of the existence and situation of the pressure, or because extravasated blood cannot escape through the sponginess of the fragments when they are in a splintered fracture. Such facility is not to be expected when one of the portions of bone has been so badly displaced, so that it can be removed, having an opening equivalent to what would be produced by an operation of the trepan.

When the operation is discontinued, the skull should be shaved; indeed, this is often done immediately that surgery is called, in order that it may be a better opportunity of seeing what parts of the skull have been struck; for it is in such situations that it has most reason to apprehend fracture of the bone, or extravasation beneath it. If, however, the evidence has indicated a large wound or laceration of the scalp, the practitioner, knowing where the trepan has been applied, is frequently content with having a hole of the hair shaved off the place surrounding the injury. All that need be said on this subject is, that it is always better to have enough of the hair taken away, so that the surgeon can unobscuredly see the spot of extravasation, the scalp freely, and doing whatever may be necessary. The use of a little hair is of very little consequence, while the concealment of the seat of a depressed

nature, or extravasation, might lead to fatal consequences.

When the propriety and necessity of trephining are fully indicated, provided the wound or incision of the scalp should not have exposed a sufficient surface of the bone for the application of the crown of the trephine, an adequate dilation of such wound ought necessarily to be made. If, in the situation of the bone, there should only be a commotion, or a laceration, unattended with any wound, a division of this part of the scalp is to be made by carrying the knife quite down to the bone. In those cases in which the swelling occasioned by the violence is considerable, and attended with the presence of a cystic, or an abscess in other instances, in which there is only a commotion, under which a fracture has displaced pieces of bone may be felt; the scalp must be divided in the same manner, only with greater caution, lest the point of the knife should penetrate itself through the fracture, and be pushed to the dura mater and brain.

Authors recommend the shape of the incision to be different, according to the kind of fracture and the parts of the head on which the violence has operated. When the whole extent of the injury can be brought into view, by means of an incision having the form of the letter Y, the incision should be content with such a division, but if this be not sufficient, he may give it a crucial shape. When the trephine is to be applied to the squamous part of the trepan bone, we are recommended to make the incision as thick as possible in the shape of the letter Y, the branches of which are to be straight, and the angle downwards; in order that as late as possible of the temporal vessels may be cut, and that the division of its fibres may be avoided as far as it is in our power.

Having divided the scalp, the next object is to reflect it, but no man would be warranted in cutting any part of it away, although such practice is advised by Ford. The purpose of the operation is not to require any removal of this kind; and the method would leave a wound which would be long in healing, and which would never escape from disfigurement. In short, the reflected flap of the scalp is capable of adhering to the parts on which they are laid after the operation, and consequently ought never to be wantonly cut away.

The scalp being reflected, nature next advises us to scrape away the perforation, either with the hand or the raspatory. Perhaps this sensitive way be considered as one which does neither much harm nor much good. The design is to facilitate the application of the trephine to the bone. However, the touch of a proper instrument, in good order, will not be impeded by the slender pericranium; and scraping this sensitive away from parts of the skull which are not to be removed may conduce to calcification.

Sometimes the bleeding from branches of the temporal or occipital artery is so copious, that the best cause be very conveniently performed before the hemorrhage is stopped. If it be prudent to wait a little, and the case (as it generally does) should be likely to be benefited by the extraction of blood, it is no well when the bleeding ceases for a certain time. The surgeon may then put direct an assistant to put the end of one of his fingers on the mouth of the vessel and prevent its operation. In some cases, the bleeding might be so troublesome, that it would be better to cut the artery at once.

All parts of the cranium do not admit of being trephined with equal convenience and safety. It has usually been set down by surgical authors, that the trephine cannot be applied below the transverse ridge of the os occipitis. There the same rules, however, which prove that such an operation may be safely done, and that we ought not, in urgent circumstances, to be afraid of dividing the trephine and compressing arteries, in order to be enabled to apply the trephine to the bone.—(See *Mitchell's Case* in *Med. Clin. Trans.* vol. 2, p. 194, &c.)

The situation of writers who limit the application of the trephine to the frontal sinuses, is consequently of the intermediate duty of these crania, and the application of trepanning to the frontal sinuses. However, Lattre has deviated from this precept in several instances, and his practice confirms the statement of Mr. C. Bell, that by opening the frontal sinus with a large trephine, and then using a small one, the internal junction of this

cavity may be trephined with perfect safety, and no risk of injuring the dura mater with the saw.—(See *Lattre's Méth. de Chir. Opér. Militaire*, t. 2, p. 136—137, &c.)

Written also caution us not to apply the trephine to the superior inferior angle of the parietal bone, in consequence of the middle artery of the dura mater lying under it, generally in a groove of the bone, and occasionally in a canal in its very substance. In the latter circumstance, the position of the parietal bone could not possibly be taken away, without wounding the vessel. However notwithstanding this advice, which has been unthinkingly handed down by one master to another, from generation to generation, I very much question the existence of the doctrine. We undoubtedly rapidly affirm trephining this part of the cranium, we can probably do so. But the cases demanding this operation are always so urgent, that the patient's sole chance of existence depends on their quick removal. Hence, were these pressure on the bone, either from a degenerated portion of bone, from blood, or matter, and such pressure could not be removed without trephining the superior inferior angle of the parietal bone, what operator would be afraid of doing so? Besides, the fear of the hemorrhage has been very undervalued; for the judgment of the artery in a deep fissure of skull, which authors have proved not to be rendering the suppression of the hemorrhage more difficult, is a mere visionary idea, as it is well known that a little plug of fat, pushed into the orbit of a vessel so situated, will at once stop the bleeding, with as much certainty and ease as can possibly be imagined.

The foregoing suggestion was made in the early editions of my works, and I now see the safety of the practice has been confirmed. "I have also applied the trepan upon Lattre's over the track of the opthalmic artery, at the inferior anterior angle of the parietal bone. The artery was divided, but I stopped the hemorrhage almost immediately, by applying an iron probe not far."—(See *de Chir. Opér. Militaire*, t. 2, p. 136.)

Writers, until very lately, also cautioned us from trephining over any of the sinuses, and especially over the sagittal sinus, because which the longitudinal sinus is situated. The fear of the dura mater being injured, and of the vessel being wounded, was the reason for this advice. With regard to the sinuses in general, the trephine may be applied as high as well as in any other part; and as for the sagittal sinus, many facts confirm the propriety of not being deterred even by its though situated immediately over the occipital sinus. It is to be remembered, now, that the dura mater is a mass of extravasated blood, and matter beneath the cranium, is attracted by the attraction of such fluids from the lower table.

By means of a perforation practised over the sagittal sinus, Garretson successfully elevated a portion of bone which pressed upon the longitudinal sinus, and made the patient quite conscious. The depressed piece of the parietal could not have been so advantageously raised, had the trepan been applied in any other situation. But a still stronger argument is in favor of this practice, when the case at all requires it, is the fact that wounds of the longitudinal sinus, and the hemorrhages consequent from them, are not attended with any special danger. Sharp mentions his having twice seen a bleeding of this kind. Another instance is also recorded in Wagner's Cases. A child received a blow on its forehead; the two parietal bones were fractured, and a considerable richness depressed on the dura mater. The child lived a month without any operation being done; but at the end of this time Warner applied the trepan. He found a quantity of blood oozing in with a ray into the longitudinal sinus, but it could not easily be got out; consequently he enlarged with a lance the opening in which the spout was completed. The hemorrhage, which was copious, was easily stopped by the application of a little dry lint, and the child was restored, though it died at the end of two months, after suffering a variety of symptoms which had no connection with the wound of the sinus, the opening of which was ligated. The fourth case, related by Marshall, also proves that wounds of the longitudinal sinus are not fatal. But and Calver from some reported other facts, leading to the same conclusion.—(See *Appl. Chir. Moderne*, p. 1, p. 88, edit. 1786.)

Whenever a depressed fracture can be elevated to its proper level without applying the trephine, and with the mere aid of a pair of forceps or an elevator, trephining should never be performed, unless there be strong reason to apprehend that blood, or matter, lodged on the surface of the dura mater, contributes to the production of the bad symptoms, and constant pressure be discharged.

The scalp having been divided, if necessary, and the trephine being adapted to the surface of the bone, according to the common precepts and practice, the next thing is the application of the known of the trephine.

The trephine is first to make a little incision with the point of the centre pin. For the purpose of marking the place where it will work, when the crown of the trephine is applied in the proper situation, for where such incisions are made, the operator must make a small hole with a perforator, in order to fix the point of the centre-pin, on which the crown of the instrument turns backwards and forwards, as on an axis, during the first stage of the operation. Mr. Denigrey's centre-pin makes a perforation, without need of any particular instrument for the purpose, and in this respect is of advantage.

The point of the centre-pin having been fixed, the trephine is to be turned by regular oscillating motions, alternately to the right and left, which motion is effected by steady pressure and rotations of the operator's hand. The teeth of the saw having made a marked circular groove, in which they can readily work, the trephine becomes steady, and as it would, if not withdrawn or removed, certainly injure the dura mater and brain, by reason of its projecting farther than any other part of the instrument, it would be an expedient to draw it in a woman after a proper circular groove had been formed by the teeth of the saw.

The beginning of the sawing might be executed boldly and quickly, for the operator must be careful of doing mischief. It is necessary, especially, with the view of facilitating the action of the instrument, to clean away the particles of bony matter with a little brush, usually kept for the purpose in every box of trephining instruments. When this has been effected, the action of the cylindrical saw would be very much clogged.

The operator, however, must increase his caution, when the sawing has made greater progress; for were he to be too bold, he might sometimes increase the massiveness of the brain with the teeth of the instrument, particularly in the thickness of the cranium, as when to induce variety, but in different parts of the same head and in different subjects. Let the surgeon, therefore, never forget to examine frequently, with the point of a quill, whether any part of the bony plate is cut through or nearly so; for when this is the case, the instrument must only be worked in with a try or to make pressure upon, and cut, the part of the circle which yet remains to be divided. In some few cases, it is said, that the surgeon can distinctly feel when the teeth of the saw reach the dura or pericranial membrane between the two tables of the cranium, and some writers have merely directed us to run with hollow till the sensation of the membrane is communicated to our hand, and fingers. However, I believe, this possibility of discerning the arrival of the teeth of the saw at the dura is an uncertainty and an fallaciousness, that it should never be expected or relied on. Nor ought the surgeon to saw with uncertainty, force and rapidly, till he sees the teeth of the trephine clearly, which appearance has been apt taken as another evidence of their having reached the dura. I have already stated, that a great many skulls have bony are some between several parts of the trephine. This is particularly often the case in the parietals.

A patient man will always prefer cutting a little lower for the purpose of leaving more of the bony substance, making the circular piece of bone, in making any hazard of injuring the dura mater by having too deeply. After a certain time, therefore, it is better to lay down the trephine, and endeavor to elevate the portion of bone, with the aid of a pair of forceps constructed for the purpose, and kept in most cases of trephining instruments, or else by means of an elevator, which is still more calculated for the purpose.

When the circular piece of bone has been taken out,

and the edges of the perforations are scraped and polished, the irregularities are to be cut off with the trephine itself. When there is extraneous blood so deposited on the opening which has been made, it sometimes spontaneously makes its escape, and if it should not do so, the surgeon must remove it himself. If the perforation of the skull should not suffice by letting out the blood, so much more of the trephine might be removed till the trephine be so constructed that might; there being no comparison between the danger of repeating the application of the instrument, and that of leaving a quantity of undischarged, coagulating blood on the surface of the brain. Certainly, many facts on record assure, that the dura mater has very extensively recovered without dangerous consequences. Passing into a white cerebral tumor (tubercle), in consequence of a blow on the head. Every thing is similar here, and Marsden makes mention of a woman who had lost the upper part of the os frontis, both the parietal bones, and a large portion of the occipital, all of which had come away in the same time; yet she recovered. Various, however, who seems also to relate this curious case, attributes the exhibition to not being quite so common.

I am of opinion, notwithstanding these facts, that exposing a large part of the dura mater with its capsule is by no means an operating clamp from which danger. And what I consider the chief danger, is my having known instances, in which persons who had been much injured by a blow to the head, and for the sake of violent pains in the head, as, and in consequence of the operation. I write this observation, with anxiety of the successful nature of the practice advocated by Dehaenckx. (Wunderk. 8, 1, p. 434.)

However, I perfectly coincide with Wilson who directs the removal of as much bone as is necessary to enable him to be able to remove the whole of the pressure from the surface of the dura mater.

The application of the trephine, in cases of large extrusions, must in particular be made several times, when the situation of the fluid does not allow it to escape. But in this circumstance, Dehaenckx says, that we should not make numerous perforations at along the extent of the extravasation, but only a counter-opening, as is done on the left side. This author expresses his surprise at there not being recorded many examples of counter-opening even in the cranium, since anatomy demonstrates their utility. I cannot help remarking on this part of the paper, that was very obvious objection to making repeated trephines in the cranium, is the impossibility of knowing, with certainty, whether blood lies under any particular part of the skull; whereas, in disease of the soft parts, the surgeon feels the fluctuation of the matter, and knows that his counter-opening will be made in the cavity containing it. One may sometimes have occasion to make so, that our intention is to discharge blood extravasated beneath the skull, when the flow has happened near a point, in which the dura mater continues adhered to a single opening, made only on one side of the artery, might not only vent but a part of the extravasation.

When the trephine is applied, on account of a fracture with depression. Mr. Brooke considers the removal of a small portion of bone as generally sufficient; so when the case is an extrusion of blood on the surface of the dura mater, he recommends a large removal of the skull. He was led to adopt this rule by having seen a case, in which, after two triangular pieces of bone had been taken away with a straight saw, and a large quantity of blood discharged, to the great relief of the patient, supuration followed took place on the surface of the dura mater, notwithstanding the wound had been repaired by the extravasation from the bone. The matter was followed by the surrounding tissue, from exuding by the aperture already made, and though another portion of bone was removed, the patient was too late to save the man's life.—See Med. Obs. Trans. vol. 24, p. 267.) Whether so extensive removal of the cranium ought to be usually made in anticipation of supuration of the dura mater in such a case? Whether such a removal might not rather tend to make the cerebral matter more exposed, and whether the position which Mr. Brooke admits adapted might not have been the best, though, in the instance brought forward, unsuccessful? are questions

Work, in which the most skillful surgeons may be little different of opinion. As my principles lead me to disapprove of the old method of opening for the purpose of preventing inflammation and suppuration of the dura mater, they would induce me to be content with rigorous antiseptic treatment, and discharging the residual fluids as soon as the effects of its pressure begins to show themselves.

If we should not find blood lodged under the arachnoid, but the dura mater should seem elevated, brown, dark-colored, having a prominent fluctuating tumour outside, it may be cautiously opened with a bistouri in the middle, with a view of letting out any collection of blood underneath. In the article *Head, Injuries of*, I have stated the result of Mr. Althaus's experience, in regard to the operation of opening the dura mater. This gentleman would use the method very effectively discharged all the blood, but only the worse part of it. The evacuation of any of the compressing fluid must, however, be desirable; and if the surgeon cannot do more, yet he has fulfilled his professional duty.

Although Mr. Brodie admits that wounds of the dura mater are attended with great danger, he expresses of the practice here recommended (see *Med. Chir. Transactions*, vol. 14, p. 287), and supports his opinion by reference to an interesting case under the line Mr. Cheever. This gentleman was called to a patient, a year and a half old, which had received a severe blow on the head, and lay insensible and convulsed. There was no wound of the scalp, but the fontanel appeared somewhat elevated. It was therefore opened by a trephine, and raised some to remove the congested dura mater; beneath which the purple colour of extravasated blood was plainly discernible. A puncture having been made with a lancet, three or four ounces of blood issued out with considerable force; the symptoms were satisfactorily relieved, and the child recovered.—See *Med. Phys. Journal*, vol. 5, p. 265. An analogous foregoing an equally interesting proof of the practice here advised, is also published by Mr. Brodie from the practice of my friend and neighbour, Mr. Ellis.

The utility of trephining is not limited to discharging extravasated blood or matter lodged underneath the skull. This operation frequently enables us to remove depressed portions of bone. The latter object can often be accomplished by merely making one perforation. Sometimes several perforations are requisite to be made near each other. Artists were wise, that it may also become necessary to remove the surrounding portions of bone with a pair of cutting forceps. The supposed part may then be firmly raised by means of an elevator. Occasionally, indeed, I may say, very often, the best practice is to remove the depressed portion entirely, takes its total assumption from the rest of the skull may be accomplished by raising across the base of the depressed piece.

According to some writers, if, after dressing the dura mater, the surface of the brain appears smooth and fleshy, with a fluctuation, we may conclude there is all disease in its substance, and these authors, more extensive with their pen, it is to be bled, than with their scalpel, mention the method of carrying the point of the bistoury to the depth of an inch, if circumstances render as deep a puncture necessary. "But," says Richardson, "experience forbids us to go farther. Cutting the surface of the brain causes no pain, and it produces less danger than one might apprehend; experience and observation prove its opposition to phlogistic theories; that the essential parts of this organ are situated some six lines, and that its surface may be removed without danger or pain."—(*Neurolog. Jour.* 1, 2, p. 201, et 2.)

A case, in which Daguerre, painted a history to the depth of more than an inch into the brain, and that he set on fire and a half of pure, is recorded in a valuable periodical work.—(*Sci. Jour. of Foreign Med.* vol. 18, p. 286.) Some temporary mechanical relief of the chest had a fatal termination.

After the operation of trephining, the divided scalp it is to be guided as nearly as possible in its natural situation, and tightly dressed with a simple powder of any essence in astringent character. In applying the dressing, the surgeon should invariably keep in view these objects: namely, to let whatever is put on the wound be as light as possible, not apt to stick to the wound, and of a nature to keep without irritating.

All assistants are to be strictly avoided, nor will any bandage be better than an ordinary night cap of sufficient size to be put on with facility. It may be secured with bits of tape, which not to be tied under the jaw.

The practitioner should not lose recollection that he has done all that he ought to do. Let him remember the urgent necessity of keeping off, or discharging, the inflammation of the dura mater and brain, which is still to be feared. Let him bleed the patient largely and repeatedly; exhibit saline purges, diuretics, and anasthetics; and if the symptoms continue, let him apply a blister to some part of the head. I shall avoid, however, any repetitions on this subject, by referring to *Head, Injuries of*.

The aperture in the skull usually becomes closed with soft granulations, which slowly acquire a hard consistence. While the cranium is wet, it should be protected from external injury with a thin piece of bone or metal. Excitations from the margin of the perforation sometimes retard the healing of the wound; but even that the practice of dressing with drying effluvia application has been exposed, and the removal of any part of the scalp is continued by all the best surgeons, these unpleasant consequences are avoided much less frequent than in former days.

The reader may find an account of the operation of trephining or trepanning in every system of surgery; but he should particularly consult the writings of Sharp, Le Moine, Brown, Blandin, Pott, Schaeffer, Schaeffer, Hirsch, Denon, Abernethy, Denon, Callender, Richardson, C. Bell, and several parts of the *Med. et Chir. de Chirac*. Also, *Le Cerebro et les Joints de la Base*, by M. Ch. Pons, vol. 14.

This article on the trephine contains perhaps the most valuable practical information any where to be found in the language. The excellent diagrams between construction and consequences, and the valuable arguments against the indiscriminate use of the trephine, and in favour of large and repeated evacuations, cannot be too frequently known nor too highly estimated, especially by the young surgeon.

It is a high source of gratification to be able to record, that in this country, the trephine is now much more seldom used than formerly. But a few years ago, for a man being strangled by a horse or a fall, in any considerable extent, almost any neighbouring physician would apply the trephine without hesitation, and the facility with which this operation can be performed, offers no small temptation to the more careless, especially as there is seldom any risk of life, and always a gain in reputation among the multitude. It is now very generally viewed as it ought to be, as a desperate remedy, known the symptoms of compression by depressed bone, or extravasated blood, not altogether unimpaired, and a consultation with the best surgeons is always desired.

I have seen several persons, who would have formerly been trepanned, without even a "trial by jury," recovered from coma, paralysis, and convulsions, partly attributable to compression on the brain, by very large and copious bleedings, aided by cathartics and stimulating tonics and stimulants to the circulation.

Still, however, there will be a sufficiency of instances, frequently requiring the use of the trephine, to render it necessary that every practitioner should be conversant with the instrument, and all the circumstances connected with its use. Indeed, some of the most deplorable cases in which surgical assistance is ever rendered, are occasionally met with under the example in which the trephine becomes indispensable.

In the year 1819, I attended Dr. Henry Wm. Dracut, then a practitioner in the city of Baltimore, in the performance of this operation on a woman who had received several blows on the head with an axe, from a brutal husband. We could discover no depression of bone, and yet the signs, stertor, anisoplegia, and other evidences of compression, rendered us all perplexed, and we the third day after the violence, we determined to apply the trephine, being convinced by previous reasoning in our opinion, that there must be extensive extravasation of blood beneath the cranium. On removing the circular piece of bone, with the largest crown of the instrument, a coagulum was found extending over the left hemisphere of the brain, which we the dura mater. This being removed, and only a dissection of the arachnoid covering the cere-

along with it in the same improper direction. Long-established purulent discharges from the lachrymiferous glands likewise speed the shape and consistency of the distichs of the eyelid, and therefore not infrequently occasion trichiasis. Scarpa doubts whether a spasmodic contraction of the orbicularis palpebralis muscle can ever be a cause of the disease.

The strabismus which most frequently results from the lachrymiferous glands pointed upon the cornea and while of the eye, as Scarpa observes, may be easily diagnosed. The eye is rendered still greater by the lachrymiferous glands which remain lessening much longer and thicker than those which retain their natural direction. And although the trichiasis be confined to one eye, both the eyes usually suffer from the effects of the disease. Indeed, generally, the eye on the sound side cannot be moved without encountering pain in that which is exposed to the irritation and action of the infected lachrymiferous glands. In almost all cases, both the eyes are very sensitive, and incapable of bearing the light. As, in cases of incomplete trichiasis, the patient retains some little power of opening the eyelids for the purpose of seeing, and thus more frequently towards the internal angle of the eye, the lachrymiferous glands are often included in an inverted position, as first in children a dislocation of the neck and sometimes in an adult produced, which cannot be rectified without difficulty, even after the trichiasis is cured. Otherwise, and children are ignorant of the strabismus arising from the infected lachrymiferous glands, and therefore are constantly rubbing the eyelids, whereby all the ill effects of the complaint are nearly increased.

The cure of the second species of trichiasis, or that which is commonly met with in practice, is accomplished by artificially erecting the eyelid, and fixing it permanently in its natural position, together with the eyelashes which protrude the edge of the eye. According to Professor Scarpa, this indication is perfectly fulfilled by the removal of a piece of the skin close to the edge of the eyelid, of such a breadth and extent that, when the cicatrix is formed, the tarsus and margin of the eyelid may be turned upwards, and sufficiently separated from the eyelid, the cicatrix of the lachrymiferous gland being a point of support fully adequate to keep the points in their natural position and direction. Scarpa believes that very few modern surgeons, with a view to the radical cure of this disease, have pursued any successful effort at plucking out the inverted eyelashes, binding them with birds, and retaining them with sutures of silkworm gut; or in plucking them out, and destroying their roots with caustic; much less in separating the edge of the eyelid along with the hairs, or dividing the orbicularis muscle on the internal surface of the eyelid, under no idea that the disease is sometimes produced by a spasmodic contraction of it.

The following is the mode of proceeding recommended by Scarpa. The patient being seated in a chair, if an adult, or, if a child, laid upon a table, with the head raised, and firmly held by an assistant, who must stand behind the patient, the surgeon is to pass upwards, with the end of a probe, the hairs which excite the eye. Then, with a pair of dissecting forceps, at the ends of his fore-finger and thumb, he should lift up a fold of the skin of the eyelid, taking great care that the place which is taken hold of corresponds exactly to the middle of the whole extent of the eyelid; for sometimes the whole, sometimes a half, and, in other instances, only a third of the extent of the tarsus is inverted. The surgeon, with his left hand, must raise the fold of the skin more or less, according as the relaxation of the integument, and the anteriority of the tarsus, are more or less considerable. The reason of this is evident, viz. the greater the quantity of skin which is raised, the greater is the quantity which will be cut away. Supporting the patient to be an adult, as soon as the fold of skin has been raised to a certain degree, the surgeon must request him to open his eye; and it is then as the tarsus and eyelashes resume their natural place and direction, the portion of skin already raised will be sufficient for the purpose. Whereas integuments are elevated by means of a pair of dissecting forceps, and thus is taken to lay hold of the skin precisely on the middle point of the whole extent of the trichiasis, it necessarily follows, that the consequent removal of the skin will form an oval, and that the greatest width of the wound will correspond exactly, or nearly so, to the middle of the eyelid, and its narrowest parts to the angles, or inner

extremities of the inner. This constitutes very sensibly to make the cicatrix correspond to the natural fold of the eyelid, and under the origin of the disease of an opposite nature to the one about to be removed, to raise the angles of the eye, viz. a turning out of the commissures of the eyelids.—(See Engravings.)

Besides this caution, relative to the situation and degree of the fold of the integument to be cut off, the surgeon must be careful that the division of the skin be made very near the inverted lachrymiferous glands. Were this circumstance neglected, the operation might have the effect of increasing the disease, after the wound is healed, that although the eyelid is straightened, on the whole, from the eyelid to the place of the cicatrix, yet it is not equally so at the space which is between the edge of the eyelid and the cicatrix of the skin. Hence, the lachrymiferous gland, so turned upwards sufficiently to keep the eyelashes from rubbing against the eye.

The surgeon, holding up the fold of skin by means of the forceps in his left hand, is, with a pair of probe-pointed, sharp-pointed scissors, to cut off the whole of the integument being fast upon that one of the blades of the instrument is applied close to the edge of the eyelid. If the eyelid should be affected, the surgeon ought to make immediately be done upon both of them, with such caution, and in such proportion, as the extent of the disease, and the degree of inversion of each eyelid may require.

Scarpa warns surgeons not to employ any means to make the wound, and expresses that it will be sufficient to keep the eyelids as much separated as possible, if the operation has been done on the upper eyelid, or, if on the lower, is to support it against the inferior part of the orbit, by pressing it from below upwards, so as to keep the edges of the wound from becoming apposed. Then the lips of the wound are to be brought exactly together by means of adhesive plaster, which should extend from the superior margin of the orbit to the zygoma; and the maintenance of this state of the wound will be still more securely effected, by placing two compresses, one on the eyelid, and another on the zygoma, together with a bandage. On the other hand, Lamechlock disapproves of the common of sutures, by which he finds that the wound may be both more accurately and expeditiously joined. Indeed, he expresses himself generally in favour of suture, where the wounded part is liable to be disturbed by its natural action of muscles.—(See Engr. C. I. p. 415, &c. 22nd. However, 1818.) Lamechlock, however, takes care to withdraw the ligatures in about twelve, or at most twenty days, before, as their longer continuance would produce suppuration. He is also particularly insistent upon the utility of bringing the edges of the incision together with a suture, and both he and Lamechlock employ Scarpa's mode of which have transverse pieces, calculated to take better hold of the lips of skin to be removed.—(See Engr. C. I. p. 114.)

On taking off the first dressing the third day after the operation, the surgeon, with God, says Scarpa, that the lachrymiferous glands by eye with care, and that the inverted tarsus and eyelashes have resumed their natural position and direction. In the partial or incomplete trichiasis, or that which only occupies a half or a third of the whole length of the tarsus, and in subjects who have had the skin of the eyelids very loose, Scarpa has often found the wound perfectly united on removing the first dressing.

When, however, only a part of the incision has healed, while the rest remains disposed to heal by suppuration and granulation, the surgeon is to cover the wound with a small piece of lint, spread with the aqua-ammoniacæ, and if the sore should become fleshy, it must be occasionally touched with the argentine nitrate, until the cure is finished.

With regard to the first form of this disease, or that in which the eyelashes project against the eyeball, without the natural position of the tarsus being at all altered (a case which is extremely rare), the accomplishment of a cure is very difficult, since, without the pulling out of the hairs, not leaving the situation of their roots, nor means at all to be dependent upon for producing a complete cure of the disorder; and leaving the tarsus out of its natural position would make the patient liable to an irreparable dropping of the tarsus over the cheek, attended with a chronic thickening of the lining of the eyelid. It has only been in young subjects, that Scarpa has ever seen the required and

In a similar way, at the inner angle, without irritating the patient's eyeballs. "The length of which the perpendicular incisions at both angles ought to extend must now be decided upon by the appearance of the part: they must be continued, if necessary, by repeated incisions with the scissors, until that part of the eyelid containing the tarsal cartilage is perfectly free, and is evidently not acted upon by the fibres of the orbicularis muscle." The part included in the incisions is now to be completely removed, and obtained by the dissection of the specimen's left hand against the patient's brow; taken, if any larva is observed to be observed, covering the lid, it is to be divided. "On lifting the eyelid and on the eye, the edge of the tarsus and the hairs will frequently appear in the same situation, in consequence of the relaxation of the ligament which bound them down; but if the tarsal cartilage has become altered in its curvature, this will be immediately perceived: it will then present at its convex edge, and be completely bent at its concavity, more especially in the inner case, where it is now powerfully acted upon by the ciliary muscle. On drawing the patient to raise the lid, he usually attempts it, but the action of the levator, in such cases of various curvatures, causes the cartilage to assume its situation, and on examination the curve will be observed to be so persistently vicious, for about an eighth of an inch at each extremity, and especially at the inner, that it cannot be induced to resume its natural situation. When this is the case, the cartilage is to be divided exactly at the place where it is bent in its length, and in a direction at a right angle with the perpendicular incision, the portion thus cut is only connected with the common fragments of the eyelid, and although the incision scarcely exceeds one, and never two, eighths of an inch, at both extremities, and in general it is only necessary in the inner, a needle the cartilage to remove the altered curvature of the part." The cut proceeding in Mr. GUTHRIE'S operation consists in cutting away a fold of skin from the part of the eyelid between the incisions. Three or four ligatures are then to be introduced, and the divided parts, from which the fold has been removed, are to be brought together by the ligatures, each of which is to be twisted and fastened to the forehead with several short strips of sticking plaster. The Aid of this should be renewed regularly with the finger, and as near as possible to the margin of the eyelid. It may then be taken hold of with four's forceps, the grasping pieces of which are knurled, slightly curved, and bent with a spring. The skin thus taken hold of, which need not be large, may also be cut away with a large pair of curved or straight scissors. The ligatures are first inserted at each angle, and when the viscous substance is considerable, Mr. Guthrie may insert three through the skin, but takes care to separate the natural one include, or to leave just, the outer edge of the margin of the eyelid. The ligatures, thus placed, are to be equally drawn up on the forehead, until the eyelid is completely everted. When they are to be removed in the manner above specified. It is then to be moved down by the first incision, and make the granulating process necessary, the edges are closely finished with the sulphuric acid of copper. The eye and eyelid are now to be carefully cleaned, a piece of lint, moistened with the oleo. tennos, is to be placed upon them; a clean compress under the edge of the skin, and a restraining bandage over the whole. The next morning the bandage and lint are to be removed, the eye washed and dressed, and the dressings repeated. On the second day, great care must be taken that the ligatures keep the lid sufficiently moist, and if any action has taken place by sufficient at the angles of the incisions, it must be broken through with the lancet. On the third day, the phlebotomy in the forehead should possibly be repeated. The ligatures themselves must be supported by strips of plaster, placed vertically between them, and the edges of the incisions should be treated again with the sulphuric acid of copper, or separated with a probe. In a few days more, the ligatures fall their way out; and by the time the parts are healed, the eyelid will have resumed its natural situation.—*Operative Surgery of the Eye*, p. 21, 5th ed. Operations on the eyes principle are also recommended by Mr. Guthrie for the lower eyelid.

When a surgeon chooses to try the fengshui opera, can he predict to be certain that the children of the

there is no altered in the shape as not to afford much change of efficiency) of the fluid within.

Intermittent, the lower eyelid is much less sensitive than that of the upper eye. The late Mrs. Blandford wrote me this disease often from the same cause which induces it in the upper eyelid, though he is more subject to the possibility of such a case. However, I met with several instances of the affection in consequence of erysipelas nasale, which, as they increased, carried the orbital edge of the tressa *orbis* up, and in the same proportion inflated the ciliary edge towards the edge of the eye.

An invagination of the anterior papillera is sometimes produced by induration and swelling of that part of the conjunctiva which connects the eyelid with the eyeball. In cases of epiblistaria this membrane often lacerates between the latter parts a distinct fold, which is situated just on the inside of the orbital edge of the tarsus, and passes to the outside; while the contraction of the arched ligament draws the ciliary vessels upwards, and induces it between the swelling of the conjunctiva and the eye. In this peculiar case, Mr. Saunders advises us that replacing the eyelid in the early stage of the disease, and maintaining it so until the epiblistaria has been removed by proper means will be found efficient. But when the conjunctiva is much thickened and indurated, Mr. Saunders recommends raising with dressed part of it away, and the application of compresses to keep the orbital margin of the tarsus upwards.—(See also *Travers's Synopsis*, p. 251 and 256.)

Altman has recorded a species of tickling, which originated from the growth and insertion of one of the hairs upon the mucous membrane. The place of exit consisted in plucking out the irritating hair, but it is not mentioned whether it grew again.

1. Scudlery, Frederick. *Memoria*, viz. Mariae Mariae Alshoff, 12mo, Nork, 1854. Scarpa's galli *Principale Mollele degli Epti*. R. Crispino, Firenze. *De Entropion*, Lond. 1860. Sarsland's *Obs. on several practical Points relative to the Diseases of the Eye*, of R. Rokitnik's *Lehrbegründe der Wandernachkrankheit*, &c. G. J. Fied. *Labor von den Augenkrankheiten*, &c. v. p. 116-117. Ess. Mein, 1837. Schlegel, *Ophthalmologie*, Paris, &c. 2. Neue Methode der Trichiasis in *Theorien*, p. 233, von. Nürnberg, 1858. 3. Trichiasis, *Spasmodic of the Nerves of the Eye*, p. 232-234, Ess. Lond. 1850. Jaeger, *Prin. prakt. Augenheilkunde*, in *Carum Medicorum Trichiasis, Distichiasis, trichiasis Entropion*, Frankfurt. This method is used by Mr. Rokitnik to be similar to that prepared by Sarsland. G. J. Galtier, *Ophthalmic Surgery of the Eye*, Lond. 1924. *Archiv. Clinique de Chirurgie*, &c. 4. 1898.

TRANSFUS. (Fused together, no grain) between. The
looked new. See Yonah.

TRICHLAMINE Triacaine: (From the French, *three* + *point*, three points, from its point being of a trian-
gular shape.) An anesthetic used for discharging
springs, fluids, and even on then-mortal frost after
revivification of the body, particularly those of the per-
sons, and tissues, vegetables, in cases of necrosis, and
byproducts. Triacaine are also employed for taping the
batteries, electrical systems, etc.

A special constituent of a perfume or cologne, and of a cosmetic, which is so adapted to the firm price of the ingredients, that when the perfume is made, they both enter the mould together with perfect ease, after which the mass being withdrawn, the cosmetic remains in the mould, and gives a ready passage for the first constituent.

which is the most of a dream, and the principles which it is made up of are unconstructed. It would be unwise to say in this book in detail every little particular in the instruction. I shall merely review, when the main principles are given, and seem to detail, the various shades of explanation. So, instead of a list of 110 unimportant shades, some of which were rare, these shades are the larger group for the ready reference of those which are so thick, greenish, or blended with my little and blue subjects.

The incision for positioning the bladder from the rectum should be longer than a crescent incision and of a curved form; i.e., as Mr. Cargoe has explained, it should not be placed too high up the rectum, but the incision be extended.

Sanctus ought always to have at least three tones.

one of full size, another of middling width, and a third of small dimensions. In cases of hydrocele, the latter is often preferable.

TRUSS. (From *trahere*, French.) A bandage or apparatus for keeping a hernia reduced. A truss which falls in position properly should compress the neck of the hernial sac and the ring, or external opening of the hernia, in such a manner, that it prevents the exit of the contents of the abdomen with protrusion with complete security. Hence, it is the indispensable quality of a good truss first, to make of dorsal and equal pressure on the parts involved, with out causing pain or inconvenience to the patient; secondly, not easily to slip out of its right position, in the varying motions and postures of the body.

Trusses are either of an elastic or non-elastic kind. The latter are composed of leather, flannel, dandy, or elastic materials. These cannot be at all depended on, and should therefore be entirely banished from surgery. Hence (as Mr. Lawrence has remarked) the use of the elastic truss varies according to the different states of the disease and to the position of the patient in respiration, a non-elastic bandage being very commonly in its degree of tightness, and keep up till the greatest or little pressure. The question of continuing tightness on when the opening is not entirely closed, and the patient who wears with a bandage may be in a state of constant misery. These also lead an active life, or are obliged to use laborious exertions, will be more particularly exposed to risk. If the patient, after experiencing these effects, endures it merely from the desire of the bandage being tight, he may confine the disease, but he produces other inconveniences. The increased pressure injures the spermatic cord, and may affect the testicle; the inguinal vessels become red, painful, and associated; and the bandage must be entirely laid aside, until the pain has recovered. Richter has often seen, painful translocation of the testicle, hydrocele, and even strangulation, produced from this cause, and entirely destroyed by the employment of a proper truss. (Truss de Hernia, p. 44.) He also saw the pad of a non-elastic bandage excite in the region of the abdominal ring a considerable inflammation, which terminated after a few days in suppuration. The truss is not applied against the rate of the abdomen. The inflammation extended to the neck of the sac and obliterated the part. (De Suppuratione, ed. 3, p. 68, 74.) The spring is a very essential part of every elastic truss, and it consists of a flat long piece of steel, which is adapted to the side of the body on which the hernia is situated. It is not a great many years since the spring used to be made of common iron, and Asseand and Richter express their preference to a mixture of malleable iron and steel, so that the instrument may be moulded by the hand in any particular shape; but, as Mr. Lawrence well observes, a truss which admits of such management must be more or less liable to the objections which apply to elastic bandages, and the only material which possesses the requisite qualities of firmness and elasticity, is well tempered steel. The front part of the steel spring has an expanded form, and when the truss is properly applied, ought to be situated over the mouth of the hernial sac. The spring of a truss has necessarily then a verticality, with the posterior end resting on the spine. Comfort is gained by every it is used to the abdomen together with the rest of the truss on the medial side, a piece of which always easily appears. Trusses of this form with a elastic of weakness, which cannot be given to them by displacing the strap. They keep up the pressure better than even a stronger spring of the common kind. Under the back portion of the anterior end of the spring is placed the pad, which should be adjusted in shape and size to the passage which is intended to be kept up. The steel spring is usually covered with leather, is lined with soft materials, and after being put on the patient, is fastened in its situation by means of a strap, which extends from the rear end of the spring round that side of the body on which the hernia has been situated. Flannel, with the fur outside, is sometimes considered the best covering for preventing the spring from the ill effects of perspiration.

When it is necessary to make strong compressions, as in large old ruptures and in persons who cannot avoid labour and exercise, the elastic spring should be

made accordingly thicker and broader. But in cases of the first-rate importance it is to make the spring gradually upon every point of the body which it covers. This is what demands the greatest attention, but of the responsibility of the instrument maker, especially making use of some individuals are flat and narrow, while those of other persons are broad and protruding. A thick flexible, elastic wire, accurately adjusted round the person, will serve to take the measure and proper shape of the spring, which may afterwards be made a little if forced necessary. The wire, however, should be somewhat longer, on account of the length of the spring.

The springs of trusses intended for children and persons who do not undergo much labour and exercise, need not be made so strong as those designed for the working, active people.

The idea that children cannot wear steel trusses is erroneous as it is dangerous, in its practical consequences; a point on which Mr. Fox has strongly insisted.

Trusses are sometimes fabricated with a pad made of the spring instead of being riveted to it. This may be improved, specially in children, according to the form of the abdomen, and it is inserted at the desired point by a spring fitting into the neck of a stick. In others, the plate consists of a screw, by which the truss is pushed further towards the abdomen in its pressure. Although these cannot be a fault than some of these inventions possess, especially the first, and are in certain instances superiorly useful, a step, we are convinced that in general their utility is not so much greater than that of common pads, as it is made thereby in the word of simplicity and the economy of expense. I should be sorry, however, to say any thing that would unduly discourage of such ingenious attempts to improve an instrument so difficult to bring to perfection at a time; especially as I believe these are particular cases in which pads with curls, screws, springs, &c. may be employed with great advantage.

Notwithstanding every care, sometimes even elastic trusses cannot be tolerated from slipping away from the parts which they are designed to compress. Sometimes they slip downwards, which is in subjects is generally caused by the protrusion of the abdomen. Consequently, the fault consists in the instrument becoming displaced in the direction upwards, where exactly happens in this position, and is produced by the flatness of the abdomen. In the disease, the displacement is to be prevented by the use of an elastic expulser; in the second, the slipping of the pad upwards is to be prevented by the employment of a steel strap.

When a patient is afflicted with a rupture on each side, the two operations may be very well kept up by means of a single truss made with two pads, which are joined together at the external opening of the ring from each other by a piece of steel, applied over the convexity of the apophysis of the pubis, and prolonged in length to the space between the two openings through which the viscera descend. As well as, however, it is absolutely necessary to have the spring stronger than if there were only one rupture. The truss should also be put on that side of the body upon which the hernia most difficult to reduce is situated. Some practitioners, however, use the pressure to the use of two elastic trusses placed together in front and behind with suitable straps.

With respect to the application and use of trusses, the following instructions seem to merit attention.

1. A truss should never be first applied, or changed, except when the patient is in the horizontal position, and it is known with certainty that all the contents of the rupture are completely reduced.

2. The first application of a truss should always be made under the superintendence of the surgeon himself, and care should be taken, in putting on the instrument, to do so in a manner that the lower end of the pad will compress the neck of the hernial sac against the pubis, while the upper portion will compress the abdominal ring. The surgeon should also make the patient acquainted with the right manner of applying the truss; the positions on which it keeps up the bands, and affords a chance of a radical cure; the requisite caution to be observed, &c. When a patient first begins to wear a truss, he should be particularly careful not to be guilty of any inelegant straightening.

less from disease, and in Tawdron are performed in an unobstructed manner. As it is a secret that the same cells of the system (infective) may be within cells and tubercles and elsewhere, may become an individual host. They may be diffused through the tissue of a system, forming swelling in its margin, before, or they may occupy the proportion of it, as seen in the *conspicua* parts, and observe there is the same type of disease (see p. 218). When enlarged growing at tubercles and forming within systems, be considered large size tubercles, the latter conceive that the tubercle apparatus, which at some correspond, in some degree, with the original distribution of the parts. The tubercles (tubercles) are at first large to the right of the parts, to the right of the parts, to the limited extension of the tubercles, and to the amount and consumption of the tubercles. In the latter system they were very many, the largest part being larger than the head of a pin, and their number defied all calculation.

* Other restrictions include arrangements of the elementary part of the model, growth of the total case, corresponding variation in their applications. Thus, when a variable is excluded, it is within the order, and are transmitted into, with variations in a series of three indicators will enable a series of economic factors.

[illegible]

Peasants are said by Arabs to grow from the *cashe* or inner surface of silver coin, or that within there, have seen (says Dr. Harmer), from a variety of this kind, the silver and its appendages converted into an enormous number of small, flat scales of the size of the far growing from it, while these scales were surrounded by smaller ones in many gradations. Some had glaucous margins, others more or less of silveryness, and others were but white changed, having thin delicate, crisp, and sometimes a transverse fold.

[illegible]

has, I must, been showing (says Dr. Buxton) that it is to the loss of the systematic character altogether, and the transformation of this basis, that the natural symptoms in this and many other diseases, are to be referred." (p. 378.)

Although I maintain the evidence and arguments which Dr. Bates has adduced in support of his opinion is unassailable testimony, the facts brought forward do not appear to me to justify the conclusion, that the formation of leucocytes and various granularly depends upon hyaline and their transformation. That hyaline has sometimes been with chemical alterations, and that cells, crystals, granules and fibrillation of various purposes are often evolved in tissues of different kinds, are facts universally received. But the presence of hyaline in the pathological state is only in exceptional circumstances; whereas, if they were generally a cause of leucocytes by undergoing some transformation, it is impossible to suppose, that some of them at least could not be more classically fixed as in distinct, dissolved forms within or around all swellings inclined to proceed from causes of them. As the growth of tumors takes on these principles could not, therefore, be accounted for without supposing a continuous proliferation and transformation of hyaline, either within or around the swelling, one would expect that some visible hyaline would be their transformation, would certainly be apparent on minutely examining the interior and the circumference of the diseased structure. Yet I am not aware that such has been proved to be transpire the mass, either by the aid of the scalpel or the microscope. The observation of crystals, cells, and fibrillated appearances in some kinds of tumors, is no proof that such modifications of structure are transformation hyaline. Besides, if my view would allow me to consider any type further, many reasons might be urged against the hyaline doctrine, arising from the consideration of the changes treated in the blood-vessels supplying parts in which a recognizable tumor is situated. Thus we often see the trunk of the arteries spouting two cells with parts, divided in size, as it were, with respect to the covered on the internal length of the ring's lumen, and ingesting at once that the formation and thence of swellings are effected through the rupture of the blood vessels. The visible effect of being the arteries by which a tumor is supplied with blood, seems also be difficult to explain if the growth of the swelling really depended upon some indirect transformation of hyaline.

It seems to be generally accepted, that the growth of all organisms may be retarded, and that sometimes they may even be destroyed by means of liquid nitrogen with freedom, but keeping the parts in a constantly cool state by the constant application of cold solution of ether. . . . However, when the increased action of the heart is again checked, and the temperature is again lowered, the arteries are relaxed, with as frequent as normal pulsations, growing electrically, reflexively, and so forth, and the heart, lungs, and liver. Very active diseases are arrested, however, are they possibly reversed by these liquid means. The reflex, easily taken, reflexly increases, reflexly, taking them, but the extension of the disease by attention is not directly attended with danger, as the affection becomes changed by them into very serious and dangerous cases, sometimes in all instances (successes). The most effective plan is to maintain the presence of carboxylic vapors with the knife, while they are kept and in an incipient stage, for then they do not die by an operation which is certainly right, compared with pain, might observed become operative, if the disease were allowed to proceed, and still in an incipient state.

Thymus, myrtaceous. These have been raised from their first family fold. They are of many kinds, some of which are single, while others are compound, with a trifoliate leaflet. Mr. Allen has attempted to form a classification of succulent plants, for the different species of which he has proposed names, deduced from the structure which he called on Gussone. The specimens are named after the kind of structure which he first considered. Gussone's names are *Digynous Succulent*. Under this title Alchemilla, including those through which apophysis is increased of the *gynostemium* part of the flower, and also some in which the growth of the leaves is increased.

which are composed of fatty matter only, but the adipose substance is increased, and their structure is looser, only somewhat more compact, so that the fatty substance is more pure of the body.—*Med. Clin. Yvres*, vol. 11, p. 447. This fact is very much against the doctrine which believes the origin of cancers to be in the blood and their transformation. Adipose tumours usually always have a thin covering, derived by the direct development of the surrounding cellular tissue. It adheres very slightly to the vessels, and easily by reflected vessels actually pass through this parietal coat, covering of vessels to the tumour. As Mr. Abernethy has frequently described, the vessels are at first, and the tumour in place, thus increasing the tension to a degree proportionate to the pressure they easily put, the danger between the artery and the capsule, is as to know the little case the vessel, and rarely catch the disease. These individuals seem to have a disposition to the formation of fatty tumours upon various parts of their bodies; as numerous examples of which is recorded in the *Annals*. The patient was a young woman, aged 18, whose constitution was not in any way remarkable. Although very thin, and of the middle stature, she weighed 100 French pounds. Her shoulders were two inches high, slender long and thin. Her arms, of less size, were situated near the right breast. A fourth from the inner angle of the shoulder blade, and half a finger long and an inch. A fifth, lower down, was six inches long and five broad. The sixth, which was larger than a man's head, was situated upon the right leg. The seventh, a small one, was below the right trochanter major. The eighth, a peduncle one, arose from the left hypochondrium, and hung down as low as the middle of the calf of the leg, being two feet long and three feet one inch in circumference at its base. All these tumours were of a fatty nature, soft, even, and quite unaltered with external organs of the vessels.—*Ann. Quarterly Journ. of Foreign Medicine*, vol. 4, p. 515.

The influence of suppose tumours to be very furnished with very large blood-vessels, and the fact of hemorrhage, which frequently does, supports this opinion, is quite uncontroverted. This is an established fact. But there is no species of tumour that can be removed with so much certainty, with such apparent safety, as with such complete security against future consequences as those of the cancer nature. However, now and then, when the tumour has been mistaken in an inflammatory stage, the capsule becomes thickened, and is very difficult to be removed by the surgeon, so that the separation of the tumour is more difficult, and requires the knife to be used freely and deeply. The tumour also sometimes becomes, after inflammation, closely adherent to the surrounding parts. Adipose tumours, often require no treatment whatever. Indeed, there can be no doubt of the fact stated by Mr. Astley Cooper, that they require a greater magnitude than any other swelling ever reaches. Mr. Abernethy has an example of one, removed by Mr. Clark, which weighed between 1000, and 1100, and which was removed previously to the operation.—*Mr. Astley Cooper also mentions the removal of a tumour of several adipose tumours of various size, one weighing 145, that removed by himself, and another weighing 145, removed from a lady's thigh by Mr. Cooper.* For a full and remarkable case is one in which Mr. Astley Cooper has removed a fatty swelling, which weighed independently of the blood in it, 1000 lbs., and was placed on the abdomen of a man aged 57.—*Ann. Med. Clin. Yvres*, vol. 11, p. 440. In one case removed from the *Annals*, removed by M. Dupuy, of Moulins, the weight of the tumour weighed, when it arrived, 45 French pounds.—*Ann. Quarterly Journ. of Foreign Medicine*, vol. 4, p. 515. Although it is true, that when adipose swellings arise in various parts, the tumour is one of the most rapid for their removal and is dangerous, and is a strong argument in favour of having recourse to the operation at an earlier period, yet it is equally true, that large fatty swellings may be taken out with a greater degree of safety than any other kind of tumour of equal size.

The next species of tumour, named in Mr. Abernethy's classification, is what he names sarcoma, from the resemblance of the structure to that of the

granular. This kind of tumour, it is remarked, is occasionally found in the cellular substance; but more frequently in the fibrous tissue, on that part of the body which is next to the skin. When a sarcoma is in the cellular, and fibrous tissue, the surrounding parts and the glands in the axilla are not affected. But some of these swellings derive from their essential character, and become of a very indolent, sometimes even, and sometimes pain, and producing no inflammatory state of the skin covering them, so that it becomes adherent to the surface. The abscesses leading to the surface are also formed, and the glands enlarged. Sarcoma tumours do not grow to a very large size, but when, in progress, is unrestrained, the pain attendant on the disease becomes lancinating, and so severe as to make the patient furnish, and lose their health and strength. Mr. Abernethy remarks, that when the axillary glands become affected, one generally grows to first, and is extremely tender and painful, but afterwards the pain abates, and the part remains indolent. Another is then affected, and goes through the same course.

To another species of sarcoma, Mr. Abernethy applies the epithet named sarcoma, from the resemblance which this tumour contains to the structure of the cellular tissue. This kind of sarcoma, Mr. Abernethy says, he has not often seen. In the example which he has seen, the tumour was about as large as an orange, and situated on a woman's thigh. The swelling was removed by an operation, but the part above and beneath it was a sarcoma, and the patient died of the disease in two months. Mr. Abernethy concludes, that the whole of the tumour had been cut away, but that the remaining parts had a disposition to decay, which was induced by the operation, and that if the nature of the case could have been known beforehand, it would have been quite to have made a fine removal of the substance surrounding the tumour.

Mr. Abernethy places the mixed tumours between such sarcoma swellings as are attended with no malignity, and the following ones which have this quality in a very destructive degree.

The tubercular tumours are composed of a great many small, firm, rounded tumours of different sizes and colors, bounded together by regular substance. Some of the tubercles are as large as a pea, others as a hazelnut in size. Some of them are of a brownish-red color; but some are yellowish. Mr. Abernethy mentions his having seen two species of sarcoma chiefly in the lymphatic glands of the neck. The fibrous tumours are indolent, become a painful and morbid state, and ultimately occasions death.

Another kind of sarcoma, mentioned in Mr. Abernethy's classification of tumours, is distinguished by the epithet sarcoma, from its bearing the appearance of the sarcoma nature of the body. It appears to be a sarcoma, and is a malignant disease, characterized by the lymphatic glands in a similar manner; it is indolent and slow, and at last proves fatal. It is particularly apt to arise in the neck, and is treated of in other parts of this book.—*See Fungus Mammaria, and Tubercle, Diseases of.*

Mr. Abernethy includes also in his classification sarcoma tumours.—*(See Cancer.)*

I have prior to another article (*Mamma, General of*), for the account of the plan of removing sarcoma tumours.

Besides many operations, which have of late years been performed, and are remarkable on account of the great size of the swellings removed, others still more interesting call for attention, on account of the nature and situation of the parts operated on. On the removal of the thyroid gland I need not here dwell, as it is elsewhere noticed (see *Thyroid Gland*); but I feel obliged to mention some other very bad operations, performed within the last few years. The first is that performed by Mr. Goodall, of Bath, in 1800. The case was an immense mass, placed on the left side of the face and neck, and the base of which was about twenty-eight inches in circumference. The disease extended from the external margin of the eye above to within three quarters of an inch of the clavicle below, and some idea of the depth of its extension may be conceived, when it is known that the whole parietal gland was involved in it. For the purpose of

obviating all danger of hæmorrhage, Mr. Goodall began each tying the second artery. The success of the operation will be best understood by adhering to the operation afterwards possessed by the wound. "The whole strumous tract was exposed, and its fibres dissected clean, except about half an inch from its insertion into the clavicle. The wound extended backwards from behind the tracheal vessels to the tracheal arteries, but became narrower in the direction of the trachea at the lower part of the neck. The sub-apophyseal gland was exposed, and almost one-fifth of its substance not appearing healthy was removed. The digastric and the greater portion of the stylohyoid were exposed. The mass of the jaw was only covered by pericardium, which when covered by the masseter muscle, part of which not appearing healthy was dissected away. The whole of the condylar process of that bone was laid bare to the same extent, and behind it the pterygoid muscles were also exposed. The substance of the clavicula was only covered by a cellular substance which did not appear healthy, but sufficient skin was saved to cover the system. The parotid gland was entirely removed." This extensive wound healed in ten weeks, but unfortunately the cure was not permanent; the disease recurred, and eleven months after the operation the poor woman died.—*See Med. Chir. Trans. vol. 7, p. 112, &c. vol. 8, p. 382.*

Regarding the foregoing severe operation, many remarks may be made to doubt the propriety of tying the carotid artery as a preparatory step, and, indeed, it is positively dangerous in all most cases it is attended to the above case; simple temporary pressure on the exposed vessel being represented as preferable. It appears to me, however, that Mr. Goodall acted less justifiably, and on the whole less wisely, because the appearance of the ligature on the carotid had only removed the danger of hæmorrhage during the operation, but created those attended, and he made himself the necessity for a possible, scarlet of ligatures on vessels which would otherwise have joined but a pleasurable quantity of blood.

Now, the necessity is so terrible from the mass branches of the carotid vessels, and more present in the case of a vessel contained in the flow of blood, that the patient may actually die from sudden loss of blood, as nearly happened in another very interesting case of removal of a large tumour involving also the parotid gland, and connected with the treatment process of the artery, the base of the shaft, the trachea, and the pterygoid process, and parts of the jaw. The operator, Mr. Carmichael, in order to complete the dissection, was obliged to divide the trunk of the facial artery: "Instantly (says he) an alarming gush of blood, which evidently came from a large vessel, followed the division, and the danger appeared the more imminent as the pressure, which Mr. T. applied with all the force he could exert upon the carotid trunk, was actually incapable of restraining the current. There was not a moment to be lost. Mr. C. then provided a dry sponge to the bottom of the wound, and firmly pressed on the bleeding vessel, while I made a further incision of the integument till it served as the cavity, occupied by the sponge, with the view of expelling as quickly as possible the mouth of the bleeding vessel. This was accomplished in sufficient time to save the patient's life." Mr. Carmichael, at the conclusion of the history, remarks, that if he were called upon to perform such an operation again, he would, in the first instance, put a ligature under the carotid trunk, which might be tightened or not as occasion should require. The case here spoken of had a successful termination. One shuddering consequence was a paralysis of some of the fibres, brought on by the division of the trunk of the parotid gland in the operation.—*See Trans. of the King's and Queen's College of Physicians, vol. 2, p. 111, &c. Dublin, 1818.*

The last instance which I shall notice of the removal of an aneurysm related to the parotid gland, is that recorded by Ellis, the eminent operating surgeon at St. George's. The patient was a woman of seventy, and the swelling extended from the ear to the shoulder. In the operation, all the branches of the facial artery were divided; a piece of the masseter muscle lying over the external carotid artery and parotid gland was left quite bare; the dissected skin covered by a new skin, and the temporary external aneurysm and carotid

arteries were of course divided along with external arteries of the neck; yet the largest of these being tied, the bleeding was very inconsiderable. The result was so successful, that at the beginning of the next week the wound was entirely healed.

The same distinguished surgeon also removed a large tumour, extending from the larynx to the sternum, and measuring three feet one inch in length, and six feet six inches in circumference. Ellis remarks, that the tumour was the supposition that it was an aneurysm formed by the union of the common carotid, but it proved to be a compound cystic tumour, and extending to the high bone, and in every direction except the anterior, inferior, and lateral parts of the neck. It was, partly, with the finger and partly with the knife, the fatty mass was separated from its membranous contents. Several vessels were cut and secured from the profuse hæmorrhage. However, not more than a quart of blood was lost. The tumour, after its removal, weighed twenty-seven pounds, and three-quarters. The patient, a woman of forty of age, went on very well for eight days, but on the ninth, she was constantly complaining of anæmia in the foot of the affected limb; her pulse became weak and trembling; and six weeks after the operation she expired.—*See Ellis, for History, the Transactions of the King's and Queen's College of Physicians, vol. 2, p. 111, &c. Dublin, 1818, or Quarterly Journal of Foreign Medicine, &c. vol. 12, p. 21.*

In the autumn of 1821, M. Roux removed the whole of the parotid gland, which it seemed to be, but in a truly admirable manner the dissection being, related, and the patient ultimately died of it. The correct dissection was made to be completely to secure the tumour. The portion of it exposed to the atmosphere was first detached. The tumour was then laid to separate the tumour from below upwards, till a portion of it was found resting on a solid point backwards and under the pterygoid process.

As to the removal of the tumour, which it would have been difficult to stop in the operation, M. Roux was determined to cut into the substance of the tumour, at that point where the deep dissection was made, and, then, dissecting from below upwards, he removed the tumour; and, together with it the lower part of the trachea of the patient aneurysm, which participated in the disease. Numerous arteries being now cut, Roux proceeded to the resection of the remainder of the tumour. A part of the trunk and lower portion of the tumour were found divided, and not cut away. Shortly the whole of the dissection below the jaw had been carefully dissected out, when a large jet of arterial blood issued from the external carotid, as one of its branches that it was very well divided. M. Roux placed his left thumb on the point from which the blood issued, and a double ligature was applied, and pressed it to close, the other artery, the internal carotid, in the clasp. The artery was then left behind and a skin patch, which the rest of the gland was dissected out. Only one small continuation of the tumour, situated just below the cervical vertebra, was left, as one of its branches in the typical parotid vein, and it was tied. As the tumour, the aneurysm was now, thereby dissected. The branches of the seventh pair of nerves had been removed in the tumour; the fifth, sixth, seventh, and eighth, however, were preserved in the lower part of the tumour. The general part of the tumour exhibited the mass of parotid gland and strumous condensation aneurysm. Towards the front process, the external carotid and with two ligatures, the stylohyoid, digastric, and, rather more dark, the small part of the trachea that was cut, found in the lower of the tumour which opened into the same aneurysmal formation. The following statement is derived from the case. First, the nature of the nature of the aneurysm was confirmed. Secondly, the ability of removing the tumour completely. Third, the tumour was a source of the aneurysm in the parotid may be stopped by ligature, and the gland it is removed by the first aneurysm that portion of the parotid which is exposed behind the jaw, is dangerous, as opening the carotid might then prove fatal, whereas if the largest portion of the tumour be first removed, and then the rest subsequently and slowly, the danger of aneurysm will be removed, and the tumour which lay over it has been left

away. Fourthly, The symptoms and lesions, by which the patient was affected, attacked on certain days after operations on the face, and the return of discharges discontinued frequently, every where plentifully extinguished. Fifthly, The paralysis of the muscles of the face which took place, is explained by the division of the branches of the seventh pair of nerves. —*See Archives Gèn. de Méd. Agric. 1834.*

Acquiescence may be maintained whether, as some natural arrangements of the parietal gland, and parts extending deeply above the throat, it would not be considered to be in contact with directly rising or falling matter, and trying wastefully stopping this large supply of blood to the diseased parts, would not be followed by an absorption of the matter? Some have ascribed to this opinion a weakening the single discharges, where the tumours by themselves fall under consideration. It was then to be seen, that the result of this experiment is but one of perpetually repeating the growth of a tumour of this kind, and even upon it has this effect at first. This certainly will, no doubt, induce many practitioners to reject the best method of cure. Yet when all things are taken into consideration, notwithstanding its nature is a few instances, it is doubtless severe, and most of itself in the generality of cases and fatal consequences. They will also be encouraged, in very similar instances, to try the effect of the ligature, by the case which Sir A. Cooper accomplished of an enormous cancerous enlargement of the lower extremity, by ligaturing it in the groin. Indeed, I am sure, that as the surgeons in London may arrange, the gift of their patients by cutting off their main supply of blood, will be much more extensively obliged than has hitherto been the case. In this way the cancer may attempt the disposal of many tumours which could not be removed with in any other manner, and which, if left to themselves, must have a fatal termination. With regard to anatomy by dissection, the plan adopted by Mr. White, Mr. Lawrence, and Mr. Brodie, of extending it by a ligature applied round its base, is doubtless preferable to the use of the knife, which may bring on a violent degree of hæmorrhage.

TUMOURS, ENCYSTED. These, which are commonly named *Wens*, consist of a cyst which is differently situated. When the encysted matter is solid, it is termed a *stone*; when more or less fleshy, *melancholy* or like *gum*, *adenoma*. These are the three species into which writers usually divide encysted tumours. However, some of these divisions do not conform to either of the above definitions, as their contents are subject to very great variety, indeed, and are occasionally of an earthy, bony, or bony nature. Some encysted tumours of the latter description are extremely hard, and imitate the appearance of bone, by the gradual projection of the matter secreted within their cysts. —*See Sir Edward Ross's Obs. on the Growth of Bony Tumours, in Phil. Trans. for 1815.* In the year 1824 I attended, with Mr. Lloyd, of Corkinnow, a medical gentleman, from whom I received a variety of new tumors, which had become very troublesome in consequence of its pressure making the parts around it sore and inflamed. It was less cut off early, and by another surgeon, but now again. At present 1828, there is no appearance of its introduction, and when I pointed by carrying the incision very deep, I saw an enormous mass of this kind existed some years ago from the removal of a man in St. Bartholomew's Hospital. Sir James Esq. performed the operation, and, if I am not mistaken, the projection of the tumor before the removal of that hospital. Sir James's most remarkable specimen of such encysted tumors are preserved in the Anatomical Museum of St. Thomas's Hospital; one is 18 inches which resembles a man's horn in shape, and was removed from a gentleman's head at Kingshead, by Mr. Esq. A further account of the case is given in Ross's *Epitaphia*, article *Bony Encysted*.

I possess every bone in Dublin (an exception in the British Museum) the bone exposed to the eye, and which, with another, at the same time, grew upon the head of a cancer subject. What is usually called bony tumors are not, as physicians would imagine, in the vicinity of encysted tumors. (*Epitaphia*, *Phil. Trans. for 1824*, *Vol. 2*, p. 182.) And yet, both more or less frequently formed, have been, and may be, within the

same situation. An interesting specimen of the latter occurrence, in a double encysted tumor in the orbit, was published some time ago by my friend Mr. Barnes, of Exeter. —*See Med. Chir. Trans. vol. 9, p. 316.*

It is observed by Sir Astley Cooper, that it is when encysted tumours are situated upon the temple and upon the eyebrows and other hairy parts, that they sometimes contain hairs. These "have no hairs not curly and differ therefore from those which are produced on members of the body which naturally form hair." In some, the cysts sometimes contain wool — (*See Cooper's Essay*, part 2, p. 225.) The tumours in which these hairy encysted tumors are produced is stated to be as follows: "The hair begins to grow from the open surface of the cyst; as fast it is cut, but soon appears considerable thickness; which it is done, but after a few weeks it assumes the character of hair." (*Idem*, p. 225; see also *Long*, in *Phil. Trans.* for 1811.)

Encysted tumours are generally of a reddish color, and are more elastic than fleshy swellings. However, the latter circumstance depends very much upon the nature of their contents, and the thickness of their cysts. As the very observation extends, extended by means of more frequently on the head than any other part, but only are very frequently met with in the situation under the description, and sometimes in deeper places. Encysted tumours are also very often seen on the eyelids.

According to Sir Astley Cooper, they are in general nearly pedicled, and when viewed on the head first very thin, but upon the face they are encased with a thin membrane and of a pale color. The skin covering them is generally unaltered, but it is soft and then streaked with blood vessels which are larger than those of the surrounding integuments. — In the centre of the tumor on the skin, a white space, that in its early state, a black or dark-colored spot may be seen, which sometimes continues through the whole course of the disease. In general, they are encased with just so much of the integument, and only require removal from the parts in which they exist, and the universally approved way they produce. They issue rarely within the cellular membrane if they are free from inflammation, but the skin in general does not early move over them. — (*See Cooper's Essay*, part 2, p. 230.) The general number of encysted tumours which this experienced surgeon has met with in the same individual, was sixteen, situated upon the head; and he has seen five of another patient, as many as which number occur upon persons themselves. — Four, five, and six, as Sir Astley remarks, are not uncommon. The largest which he has ever seen was equal in size to an ordinary corn, and grew upon the head; but in general they are not more than one or two inches in diameter. He considers them to grow upon hereditarily, as he has often, in a patient himself, "I have several swellings upon my head, and my father (for my mother) had several." They also frequently occur in several of the same family. — (*Idem*, p. 231.)

According to Sir Astley Cooper, when encysted tumours are dissected, some part of their surface is found freely adhering to the skin, while other parts are connected to it merely by the cellular membrane. The cyst itself is usually filled with a soft, fleshy, or bony substance, and in thickness is different parts of the body. On the face it is on the outer surface of the cyst is very thin; but on the back it is much thicker, and on the head it is so thick and so hard that it is often as firm as the thickness of the cornea, and is so elastic that after being compressed, it readily expands again to its former size. Within the cyst, Sir Astley Cooper remarks, there is a lining of cellular which adheres to its interior, and several discharges of the same substance are issued within the fluid. If the vessels of the cyst are injected, they are found to be numerous, but of small size. The cysts are occasionally joint with an ossified state. — (*See Cooper's Essay*, part 2, p. 232, 233.) It is the opinion of Sir Astley Cooper, that encysted tumours arise from the enlargement of the cellular or glandular pores, in consequence of the extension of their contents. — (*Idem*, p. 233.) If this last statement were correct, the fact would furnish another consideration against the view taken of the formation of it, taken by Mr. Ross. There are some tumors, however, which resist the adoption of Sir Astley's explanation; for if encysted tumors were only

effectual method of curing trypsin laparitis of the eye-balls. He admits, however, that the whole portion of the eye-balls of some instances of this nature upon the upper eyelid must be dissected out, because if it be so closely adherent to the corneal, that, if removed, would injure the latter part too much, and produce either an incurable cataract, or an irreparable shortening of the eyeball. But notwithstanding this, near the eyelids may almost always be completely excised, the only exceptions being cases in which the eyelids happen to be attached between the lachrymæ and the eyeballs, and so intimately connected with the iris of these parts, that the work of the eye would not be cut away without permanently destroying the functions of the lachrymal parts of the ocular system. However, when the shortening is not too strongly attached to the margin of the eyelid, then assuming the removal of the whole of the eye. He particularly notices upon the utility of moving the eyeball a good deal about daily, for a few days before the operation, so as to loosen its connection, and consider the subject to point it over the edge of the orbit, where it may be readily found slipping to remove.—(*M. 2, p. 512*.) Removing a few instances in which the eye has detached, and firmly adhered to the eye. But has never found it necessary, in the removal of corneal shagbills of the eye-balls, to remove any part of the lachrymæ; and he has not seen any case of this kind in which were as large as a goose's or hen's egg. The incision through the skin, however, should be deeper than the lachrymæ, so as to facilitate the separation of the detached eye.—(*M. 2, p. 512*.) When it is not advisable, for reasons above stated, to attempt to dissect out every particle of the eye, then fill the cavity with lint, till the wound suppurates, and if this plan is not sufficient, to apply trepan and cauterise. It is related by the Author Cooper, that ocular tumours at the lachrymal orifices are often cured by the use of trepan, on account of their coming into the eye, and being adherent to the membrane.—(*Surgical Essays, part 2, p. 511*.) Professor Wilson has recently recommended making the incision for the extraction of ocular swellings of the eyelids on the inside of these parts. But as Mr. Trauer correctly remarks, the eyelids are often swollen considerably, and being connected with the eyeball; in which case, the operation should be done on the outside of the eyeball. The latter writer admits, however, that the eye is often joined to even the membrane and the lachrymal membrane which covers it; and, in his opinion, it is only when an oblique adhesion exists, and the performance of a white circumscissed, infundibular is precluded, the external lachrymæ, that the incision should be performed on the inside of the eyeball by dividing the conjunctiva.—(*Spurious of the Diseases of the Eye, p. 107*.)

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thence he proceeds by degrees towards the moon in random aim. In favour of this method, he offers the following considerations:—1. By this, an artery is kept a lifetime should be cut, it thus soon becomes fully created, as the case of the tail-artery is already partly decided. The lowered swelling may also be drawn away by the large vessels with the hæmorrhoidals. Langenbeck never introduces the knife simply while there are large blood-vessels there, but pulls the swelling upwards, and then divides the artery in substance with a scissor, which is situated upon the already exposed portion of the fibrous. In this manner the swelling can always be drawn near, and drawn away from the vessels, until at last there is no danger of wounding them. By attending to these principles, Langenbeck has succeeded in removing many very large tumours from the neck, where nearly all the muscles of that part were exposed by the dissection, with the greatest success. 2. After one of these operations, not only the syphilitic process could be fully let off the muscles remaining soon at work by the healthy ones.—(Linn. *de Syphil.* 5. 2. p. 312, 3. 3. *Mon. Gallien.* 1885.) 3. G. Spengel, *De Syphilide et Principio Actus Epistola de Cystitis in Genere exacerbatæ.* *Biblioth.* 1826, 3. 3. *Frank.* *Novum Specimen Tumorum, quæ A. morbi in corp. generat et recipit, registrantur.* *Pars post.* *Helm.* 1836, 1837. 4. *Wien.* 1846, Letter concerning the Cure of syphilis and other kindred Tumours without the Knife, *Ann. Lond.* 1854. 5. *Oppert's Surgical Works.* Pt. 7. 3. *Wien.* 1856. 6. *Langenbeck's Festschrift* *Lehrbuch und andere Abhandlungen.* *Verl. Frankfurt.* 1854. 7. P. H. Weismann, *Recherches de Médecine légale.* 4. p. 1. *Paris.* 1857. 8. *M. M. Praxich's Atlas de Syphilis.* p. 317, vol. 2. *Ann. Lond.* 1858. 9. *Allen Burns, Surgical Anatomy of the Head and Neck.* 4. p. 129: this work contains much valuable information respecting the operation of venesection about the neck. 10. *Sanger, Chirurgische Klinische.* 1. 1. p. 27. 11. *Ueber Lipome und Extravasate.* *Medic. Soc.* *Nürnberg.* 1861. 12. *John Burns, An Inquiry, illustrating the Nature of Tumours called Scrophulous, or Syphilis, Nodules, and the Origin of Tubercles, and Tumours in different Features of the Body.* *Ann. Lond.* 1818. 13. *Allen's Illustrations of the Syphilis.* 4. p. 104. *Ann. Lond.* 1822. 14. *St. John's Hospital, Surgical Society.* part 2. vol. 3. 4. *Ch. Weiss.* vol. 2. C. 3. 5. *Langenbeck, Diss. für die Chir.* 5. 2. p. 312. *Ann.* 1865. 16. *Alte Geschichte der grossen Syphilisgeschwülste, welche mit dem Carcinome zu fast ununterbrochener Zeit die Trennung mit der Sage verbindet werden mochten.* *Mon. Berl.* 1. 1. p. 265. 17. *Ann. Lancet.* 1817. 18. *H. Jacobson de Tumoribus Cysticis.* *Ann. Soc.* 1820. 19. *G. Ludwig, Memoirs de médecine légale.* *Tumours des Tumeurs incluses.* 4. p. 129. 20. *L. Linton, Causes of Large Tumours in the Scrotum and Testis, removed by Operation.* *Ann. Edin. Med. Soc.* No. 77. 21. *Strömberg's Archiv.* *Analyses of the Reports.* *Ann.* 7. 4. p. 128. 22. *Fr. Trauer on the fatal Syphilis, Mercurial method.* *in Med. Clin. Weiss.* vol. 45.

Deleens has published, in the second volume of his *Chirurgie Oculaire*, numerous cases of what the French call *opht.* (opht.), including, besides the ordinary encysted tumour of conjunctival vessels, lymphoma, deposit of the stroma, and certain collections of fluid, fluid was again to be drawn by us with chronic or serofolious syringes. The first case, which consisted of a very large collection of imperious nature and more fluid, in the neck of a female, was one of this latter description, though, on section of the tumor being composed of a pouch, the disease might equally be called a cyst, or an encysted swelling. The treatment of this first form of type, the sero-mucous, as he names them, consists in opening them, discharging their contents, and then promoting inflammation and absorption of their white effluent by drying them with chloride, and pointing in this method with three caustics one after the other. An enormous encysted tumour, which had been increasing in size for twenty years past, attended with displacement of the eye, likewise enlargement of the orbit, and other deformity, was successfully treated in the same manner. And, lastly, a patient, a small boy, containing three masses of yellowish limpid fluid, and causing a protrusion of the eye, was cured in a similar way. According to Deleens, the treatment of encysted swellings should depend upon the disposition of their cysts. Some cysts are thin and transparent, others contain latex, mixed with

1898] *in remota causa*, this part should be accepted. 16. A parasite may be eradicated with little trouble, when one has been previously made with out all success, provided care be taken to make the opening precisely in the situation of the former. 17. In these last cases, if the patient's strength be not much reduced, Delpech continues the attempt, established an artificial duct by leaving in the parietes an elastic *fine catheter*, lest if inflammation come on, the solution is to be repeated. 18. *Le Drain*'s operation of passing a fine bisturi into the cyst (*le Parc* certainly) is considered, as likely to cause peritonitis, and aggravate what Delpech calls *un écou* without foundation; the commoner method aimed at the cyst. These consequences he thinks the most likely to follow, were either parties, that each treatment produces an artificial modification of the cyst. 19. An inflammation of the large cavity of the sac, he considers, is sometimes the cause of death, even without peritonitis. 20. Every thing that is known respecting internal eyes, serves in Delpech, that they are incapable of supporting the kind of treatment which takes place in the external ones; and when procured and kept open, whether they inflate or not, they inflame, and are thrown into abscess, but still retain their cavity, and the property of secreting the same fluid as heretofore; that when the parietes close, the fluid film and expands again, sometimes with its natural degree of vascularity; that the membrane that lines the internal eye spontaneously; that the inflammation, caused by leaving the eye with a history is not more efficient in opening up tubular communications, than when followed either a simple puncture, or if the glass is covered by film of keeping up a Guérin's aperture; that the practice of an incision and, in somewhat points, have most frequently only terminated in the formation of such an opening; that, in a few rare examples, in which the operation produced a complete obliteration of the cavity, the tubular eye was destroyed, by gangrene. 21. The project of treating an oval cyst (like a hydrocele) is strongly disapproved of by Delpech, with wholely explains the observations of some surgeons of this kind leads us fairly to conclude.—(*See Pigeur's* *op.*)

It appears to me, that notwithstanding the possibility of the accident, Tolpuck overrates the danger of inferred hemorrhages from passing an oval cyst; and that he ought to have admitted the serous indentation, the depression of breathing, the extension of urine, and other urgent symptoms, often produced by the great pressure of the swelling, as circumstances rendering the operation indispensable for the present relief of the patient. The reader may usefully consult what has been here said with that part of the article *Furunculosis* which treats of scirrhal dropsy.—*Prof. 1*

The *Frontal* of some of the most important theories popular in Germany, from 1820. By Robert Guzik, M.D. In the fourth number of this valuable and practical work, the reader will find nearly identical attempts to polytypic of the nervous. The present, he observes, is continuously mistaken for a long time in the nervous system, the patient, instead of a continuous, typically and moderately, has frequent and great, two meanings from the system, and in the, success, a pair of discharges. These gradually drive the circulation and induce the health, and she requires the daily patients, and induce the complaints, which are the ordinary effects of difficulty of blood. The absence of pain from the signs of polytypic, the three in other cases, and the fact that depth which stands the nature of the disease of this organ, prevents all suspicion that the hemorrhage depends a disease of structure. Types that changes are given in various forms; one primitive is considered after another, and at length, the system is examined, and a polytypic is discovered. In maintaining the nature of the system, for the purpose of determining the property of removing it by an operation. Dr. Guzik explains the mode of treatment as one of the chief points, and in this respect, what is true of polytypic of the frontal is true of polytypic of the neck and others. In polytypic of the frontal, the skull is completely removed by the neck of the nerves, and if the finger can be introduced into the skull, it makes easily passed between the skull and the remaining neck. In polytypic of the neck, the

finger cannot be passed quite round the neck. It may be pinched partly round it; but it is stopped when it comes to that point at which it is attracted to the neck. In polygons of the edge of the vesicle, the stalk does not enter the orifice, but grows from the edge of it, and is not separable by it. With respect to the structure of polyoid Dr. Gould describes them, when cut again, as presenting a hard whitish substance intersected by numerous partitions; but he adds that they are sometimes of a much softer and looser consistency, and sometimes have tooth-like cavities in them. Their external covering is the granose substance of the uterus. Their internal vessels are differential cases. Dr. Gould has observed several which were as large as the head of a new-born child. They are commonly of a tough, more elastic sort, and he has known several cases in which frequent hemorrhages were contained by a polyoid not larger than a wheat, attached just within the os of the neck of the uterus.

According to Dr. Goetz, a polypus of this kind has often sometimes passes through the entire of the neck polypoid and immovably; sometimes suddenly, during the action of the bowels. He has known several instances, in which patients, after this action, were suddenly seized with extension of arms, and, on examination, a polypus was found in the vagina, compressing the cervix.

Another valuable observation, made by Dr. Goody, is that the bleeding comes from the tumor and not from the claret itself; for "as soon as a ligature is applied, and released, regard the milk, the hemorrhage from that time ceases, although it only be several days before the tumor comes away." He notices the opinion of M. Leroy, that a polypus does not bleed while it remains within the uterus; but that after its expulsion into the vagina, the efflux of the uterus, by compressing it still, expels the return of blood to the vein, which immediately hard and dried profusely. The incompleteness of the first part of this experiment he cautiously reserves.

Two salivary glands are likely to be indications for prolyl, are, first, the parotid gland; and, second, the sublingual gland. Salivary glandular excretions from the former, is a prototype, besides the indications usually noticed, Dr. Good advertises to the sensibility of the former men (Gleason) a polysar being insensible, so that if prolyl or scratched the patient does not feel it. With regard to leishmaniasis, when this is only partial, that is when only the border depends through the on the on into the surface, and the patient is recovered for many months, the disease feels exactly like a polysar of the border. Here the skin is itching and the disease is its usual state, and the time of its first appearance, which must have been immediately after delivery.

When there is doubt, whether the case is a polypus or a malignant excrescence, De Goech recommends the application of a ligature. If the swelling has a stick which can be tied without any danger of including the neck in the folds of the tumor. According to his experience, the plan succeeds in an immense proportion of cases, and he has known it succeed in several attended with a cannibal's eagerness of the patient. Even if the excrescence should return, the patient, he says, would not be sorry if this was the case.

This excellent physician not only enjoys the constant observance of the practical rule recommended by all men of good judgment and experience; namely, that whenever hemorrhages from the uterus resist the ordinary means, the nature of the case should be verified by internal examination.

For the eradication of polyps, Dr. Green prescribes two baths, including those described and repeated in Richter's Elements of Surgery, and my First Course of the Practice of Surgery; but they are straight instead of being curved, which last advice he holds very important. The danger of including the uterus in the ligature, he thinks, may always be avoided by the following rules. 1. Extended always at joining the ligature as high as possible on the stalk, it is to be passed as low as possible, care being taken, however, to pass it over the body of the tumour. He reasons by experience, that the portion of stalk left above the ligature will not grow again, but, like the remnant of umbilical cord and falls away. 2. When the stalk grows below the cervix, or the os uteri, if it can be felt, seal best above the neck and the neck below. The

texture might, as we applied a little below the cribriform. If this channel be left, the part best guide is the ordinary length of the projecting part of the neck, that is, about one-third of an inch. When the polypus is very large, and the vagina closely contracted, it is difficult, or impossible, to touch the stalk and the cervix, so as to make an accurate measurement, but the first rule only is practicable. 3. To attend to the condition of the patient when the ligature is tightened; for if it give much pain, a part of the ligature is soon probably included.

When a polypus grows from the neck or lip of the uterus, it sometimes becomes merely an obstacle and proves innocuous. A case is related by Dr. Good, exemplifying this fact, and the great facility of dissection of the uterus to be mistaken, unless a careful dissection be instituted.

Women who have a polypus, especially one growing from the neck or lip of the uterus, sometimes become

pregnant. Of this Dr. Good has known two instances. In one, the tumour was discovered in the fifth month of pregnancy, and was removed by ligature. The pregnancy went on to the sixth month, when the patient was safely delivered. In the other case it was not discovered till the commencement of labour, and it produced death a few hours after delivery.

After relating, briefly, respected cases, and adding some valuable reflections on the numerous ability to be acquired for surgery, Dr. Good concludes with an account, well deserving of consideration, namely, that "whereas for the cure of cancerous diseases, we are on or even forty of our best physicians, and fifty of our surgeons or midwives, who are of the same rank, every medical man should study Dr. Good's work most attentively, for it abounds in every practical instruction."—Prof.

TYMPANUM. For an account of its disease, see Ear.

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ULCERATION is the process by which sores or ulcers are produced in various bodies. In this operation, the lymphatic vessels are at first to be seen in the blood-vessels. Anyhow is a class, formed on the surface of the body by the removal of parts back into the system by the action of the absorbents. At first, it may be difficult to conceive how a part of the body can be removed by itself, but there is no more difficulty in conceiving this, than how the body can form itself. Both facts are equally well explained. When it becomes necessary that some whole living parts should be removed, it is evident, says Mr. Hunter, that nature, in order to effect this object, must not only confer a new activity on the absorbents, but must throw the part to be absorbed into a state which yields to this operation. The absorption of whole parts is derived from five causes: pressure; irritation of irritating substances; weakness; distention of parts; death of them.—*Hunter on the Venous System*, &c. p. 442—443.

Ulceration takes place much more readily in the cellular and adipose substance, than in muscles, tendons, ligaments, nerves, and blood-vessels. Hence, in the progress of putrification of the body, ulceration often takes a superficial course for the purpose of bringing the matter to the skin. The skin itself, also, being highly organized, considerably retards the healing of ulcers. On the same account, when absorption is suspended, the edges of the skin hang over the ulcerated surface.—*Hunter*, p. 447—448. There is a considerable distance from the source of the circulation are generally more disposed to ulcerate, than others situated nearer to the heart; hence, one source of the greater number of ulcers on the lower extremities, than on the arms.

Non-fused parts, such as cicatrices, callus, and all analogous new matter, like ulcers, readily admit of being absorbed. Thus, in Lord Atter's voyage, when the crew of the ship began to suffer from great privations, fatigue, the scurvy, &c., it was remarked, that such men as had had ulcers and broken bones cured, became again disabled by their ulcers breaking out afresh, and the cause of their obliquities being renewed. The absorbent system is even more prone to be disturbed than what is said to be a substitute for the old. Mr. Hunter explained this circumstance on the principle of weakness.

When ulceration takes place in consequence of the death of an important part, it causes then an ulcerated state, between the dead and living substance. A cancer, when it breaks light, presents in every direction a new, with one mode of way is an ulcerated state, because when Mr. Hunter found that ulceration happens in an ulcerated state.—(P. 442.)

The particular difference in ulcers, or any analogous substance, and the natural surface, are those which are most susceptible of absorption. This is one of the most curious phenomena observed in the process under consideration. Inasmuch that there is a principle in the human body by which parts are always prone to free themselves from disease. Signs pressure

from without will often produce a discharge of pus, and hence, Mr. Hunter remarks, they may appear to be a corresponding backwardness to other forms.—(P. 443.) Both these facts, he observes, are shown in the case of Rupture (achyria); for, though the water is absorbed the cavity of the test, and a tumor in any extremity, by means of absorbing, with the Schenckian medicine even before mentioned, was to become a tumor against the progress of the fluid towards.—(P. 441.)

Not infrequently, as Mr. A. Cooper has remarked, matter forms behind the scrotum, due to the pus and perforation, which constitutes an ordinary sign. From the quantity of these abscesses, it might be expected, that the matter would pressure upon the testis, and by distending it, the cavity of the testis, distending it. Instead of this, however, the pleura undergoes no other alteration than that of becoming thickened; and while it is passing the addition of substance, the process of absorption is going on in the inner part of the system, so system is forced through it, and the matter is voided externally. The same fact is exemplified in abscess within the peritoneum and abdominal cavity. Abscess of the liver, however, generally how low the stomach or bowels, which are more in front than the skin, and afford also a passage for the matter.—(P. 442.)—*Cooper*, vol. 1, p. 322.

There is one difference between the absorption of an elevated tumour to the surface of the body, and the progress of an abscess in the inner system, viz. that the former depends entirely on the action of the lymphatic absorption of the blood parts, between the skin and skin; the latter and external the same process, in which period inflammation takes place, and absorption becomes accelerated less elevation. In an abscess, the progressive absorption begins in the first of the parts that the internal absorption is the second part covering the matter is going on.—(P. 442—443.)

The action of progressive absorption is to prevent surface, consequently to irritate causes which Mr. Hunter referred to pressure, irritation, and weakness. In cases of pressure, pressure becomes a sign. The tumours and signs of pressure are the first of the two kinds of absorption. The facts of pressure and inflammation, which have agreed with the same process, all apt to absorb. In the lower extremities, Mr. Hunter observed, that absorption is a substitute for absorption, and is, at the same time, a proof of a certain degree of strength; viz. if the patient's constitution were not weak, the same parts would absorb.—(P. 442.) The pressure is a frequent cause of absorption, it is not effected by the increased action of the lymphatic system, but by the action of the blood.

That irritating substances produce absorption, needs no illustration.

Progressive absorption may take either with or without suppuration. We have instances of neither in cases of extraneous bodies, which are evident

the body, without producing irritation enough to give rise to the secretion of pus. In the progress of emphysema of the lungs, and in fungus tracheæ of the larynx, the matter in the surface, the same fact is also illustrated.—(P. 425.)

Altered in its appearance, in other words, discolored, either happens in consequence of suppuration already begun, in which event the pus acts as pressure, or from absorption of the cutaneous surface (from particular irritation, or breakdown, in which case suppuration has not taken place).—(P. 426.)

The production of absorption requires much greater pressure than without that from within. The process is always supposed to take place more quickly when near the surface of the body, and its progress becomes accelerated in proportion as it is near the skin.

The adhesive inflammation proceeds the suppuration, and prevents the pus from becoming diffused so soon as it is wanted; and when the first adhesion is made, in order for the latter to approach the skin, the adhesive inflammation will continue to go before the suppuration process, and thus prevent the matter from penetrating their into the cavities of the cellular substance.—(P. 427.)

The pain of ulcers is, in some degree, peculiar to them in its character. When suppuration begins on a surface, it takes place, for the purpose of bringing matter to the skin, the pain is always considerable. When suppuration takes place, in order to separate a dead part, as in abscesses, carbuncles, &c., there is seldom any particular pain.—(P. 428.)

The bleeding seen always exhibits little variety, while the skin is unbroken, and this, at the same time, forming a little out, and sometimes, even in the ulcerated surface. The face of the ulcer appears flat, and the discharge heavy this.

When suppuration stops, the edges of the skin become regular, smooth, a little rounded, or turned in, and of a purple color, covered with some transparent white.—(Illustr. in *Legislation*, &c. p. 390.)

The reader, desirous of further information, should particularly consult the last publication, and *Thomson's Legislation*, p. 390, &c.

ULCERS. *Thomson* generally defines an ulcer to be a solution of continuity in any of the soft parts of the body, attended with a secretion of pus, or some kind of discharge. "A granulating surface, covering matter," has been proposed as a definition. J. A. Cooper, *Lectures*, &c. p. 192; which is very applicable when ulcers have formed granulations, but cannot include cases, in which the effects of absorption are extending, and the granulating process has not yet commenced.

In the present part of this Dictionary, there will not be occasion to speak of several kinds of ulcers, which have been treated of in other articles.—See *Cancer*, *Cancer Cris*, *Chancres*, *Fistula*, *Malignant Gangrene*, *Lupus*, *Ulcers*, *Scrophulous*, *Sicca*, and *Furuncular Ulcers*.

Ulcers are divided into local and constitutional. As Professor Thomson has well observed, however, it is only within certain limits that this distinction is well founded: for an ulcer, which is at first completely local, may in time affect the system so as to become constitutional; and ulcers, which derive their origin from some general affection of the system, may result after the removal of the constitutional disorder by which they were originally produced.—(*Lectures on Legislation*, p. 427.)

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have examples in the scrophulous, scorbutic, and syphilitic diseases, and also in the syphilitic disease, or chancre which arises not infrequently in those who have had syphilis, from the too free and injudicious use of mercury.

"Every ulcer, strictly speaking, is of a local nature; but there are ulcers which, though essentially local in their appearance, are connected with, or dependent upon, diseases which affect the general system. These ulcers ought to be regarded as modifications of, or lesions in which the disease appears, with which they are connected. Considered in this light, it is obvious that specific ulcers can be treated of with propriety only under the head of the disease to which they respectively belong.

"We call these ulcers ulcers which do not appear to proceed from any specific disease or partial disease existing in the constitution of those in whom they take place. They are usually *ulcers* *scrophulous*, and the consequences of accidental injuries and improper modes of management. They may occur in every part of the body, but they appear most frequently upon the lower extremities."

Professor Thomson, afterwards remarks, that "the appearance which different ulcers exhibit, even at first view, is so different from each other, that distinctions among them, and so they moderately in many respects."

"But (says he) it is to be regretted, that the characteristics upon which the distinctions of ulcers, as well as of many other local diseases, are founded, are neither very uniform in their appearance, nor very easily distinguishable from one another. Not only are the local appearances which present themselves in ulcers liable to great variations in the different stages of the local and general affections, but they are often apparently the same with, or at least very nearly indistinguishable from, those which occur in specific diseases, and which require for their due peculiar modes of treatment. It is this circumstance which renders it so necessary for us, in endeavoring to distinguish and to cure ulcers, to avoid ourselves of all the information which can be procured from the history of the ulcer, from the nature of the exciting cause by which it has been induced, and from the effects of the remedies which have been employed, as well as from the particular appearances which the ulcer itself exhibits."

In noticing another ground of distinction among ulcers, as that derived from the part in which they occur, Dr. Thomson observes, that "every lesion and sign of the body presents physical and vital qualities peculiar to itself; and these qualities must necessarily modify the appearances which each lesion and sign respectively exhibits in the state of disease. Specific diseases under some parts more stable than others in modes of operation. This secondary syphilis appears most frequently in the throat; scrophulous in the groin; cancer in the lower lip; and lupus and scrophulous ulcers in the upper lip or in the nose. Cancer seldom or never appears primarily in the upper lip; but syphilis, when it attacks this part, puts on many of the appearances of cancer?" a fact which Dr. Thomson says, he has learned from Mr. Pott.—(*On Legislation*, p. 425—426.)

In the valuable treatise on ulcers published by Sir Erasmus Home, those ulcers are divided into six principal kinds, viz:

1. Ulcers in parts which have sufficient strength to carry on the action necessary for their recovery.
2. Ulcers in parts which are too weak for that purpose.
3. Ulcers in parts whose action is too violent to form healthy granulations, whether this arise from the state of the parts or of the constitution.
4. Ulcers in parts whose action is too indolent, whether this arise from the state of the parts or of the constitution.
5. Ulcers in parts which have acquired some specific action, either from a diseased state of the parts or of the constitution.
6. Ulcers in parts which are prevented from healing by a various state of the superficial vasa of the upper part of the limb.

Although I have chosen, in the subsequent chapters, to adopt this nomenclature, I am perfectly aware of its being in some respects objectionable; but especially because it assumes hypothesis, the truth of which can

never be established for good. This is one of the considerations which have induced Professor Thomson to prefer the old ointment.—(*Cyclop.* p. 65—132.)

OF ULCERS IN PARTS WHICH HAVE SUFFICIENT STRENGTH TO CARRY ON THE ACTION NECESSARY FOR THEIR RECOVERY: SIMPLE, PUNCTATE, OR HEALING PLEGMA.

In this species of ulcer, the part is of a white colour, thick, smooth, and readily separates from the surface of the sore, and when dried and examined in a microscope, is found to be made up of small granules, resting on a transparent fluid. The granulations are small, hard, and piled up to the top. As soon as they have risen to the level of the surrounding skin, there is a rise in the old skin, which becomes smooth, and covered with a thin, transparent film, which gives it a white, becoming opaque and later white.

In the treatment, it is really necessary to keep the surface clean, and prevent the natural processes from being interrupted. Sir E. Home observes, and this is in general best done by the application of dry lint, for the purpose of absorbing and retaining the matter, which serves as a sort of coating for the granulations, and by putting over the lint a pledget of any simple ointment, in order to hinder the matter from separating, by which means the dressings will not become adherent, and may be easily taken off as often as requisite.

Although healthy ulcers require no medicinal application to be made to them, the dressings must be such as do not disagree with the granulations or surrounding skin.

In some patients, a roller, applied with moderate pressure, with a view of retaining the dressings, will cause irritation, and make the sore less in tendency to heal. Sir E. Home has seen several cases of this kind, in which the proper granulation of the sore returned as soon as the bandage was discontinued.

In some patients, distant trifles and influences of the neighbouring skin; and certain superficial sores will not heal while kept in a moist state, and disordered by the air; but when allowed to become dry and covered with a scab.

These peculiarities are referred by the preceding author to constitutional causes, and not diseases; for the ulcer is local as soon as the particular things which disordered granulation is discontinued. These peculiarities in certain healthy sores may also attend others of a different description, and should always be distinguished from the effects of disease.

1. Application to the form of vessels, and formation, should never be neglected, as they render the bottom of the granulations loose, and disperse the discharges to large skin.

2. With respect to local applications, Sir E. Home also very properly condemns poisons as well as irritations. The use of alcohol as being an application which prevents the formation of a scab, when this mode of cure is chosen.

3. As regards to contrary, there is only one, in that of healthy ulcers, is to keep the matter from separating. The most suitable ointment is the best for the purpose; particularly one composed of olive-oil and white wax.

Sir E. Home observes, that the great objection to the various ointments is, that they sometimes disagree with the skin, even when used and free from all sensibility. When they have acquired the latter quality, they will more frequently create a greater degree of irritation.

4. With respect to applications in the form of powder, Sir E. Home remarks, that when it is desirable to form a scab on the ulcer, any sort of powder may be resorted to; but he prefers dry lint. Nothing should touch the powder or lint; and in several instances, Sir E. Home recommends applying a little balsam on each side of the sore, and over them a roller, which will as firm one below to the other as the means of a lotion.

For healthy ulcers, dry lint is to be regarded as being upon the whole the most simple application. When the use does not require for strength in itself, but to prevent the skin from the discharges are to be changed only every other day.

When a moderately firm bandage is not retained by constitutional peculiarities, it is useful both in sup-

porting the scab and with which are often in a daily state from the greater softness of the skin, and in draining the deeply-strained parts.

ULCERS IN PARTS WHICH ARE TOO WEAK TO CARRY ON THE ACTION NECESSARY FOR THEIR RECOVERY.

There is no second of the classes into which Sir E. Home has divided ulcers in this class.

The granulations of these sores are large, and rolled on their external surface, and of a less compact texture, than those formed on skin in healthy parts. Sir E. Home has also noticed their disposition to separate. When they have fed up the surface of an ulcer to a level with the surface of the skin, they do not readily leave skin, but rising up in a sort of mass, often loose together, the power of producing new cells. When the parts are still weak, the granulations sometimes continue gradually to rise up the hollow of the ulcer, and then, at a sudden, are suddenly absorbed, so as to leave the sore in deeper and lower.

Ulcers may be weak from the first, or become so in the progress of the case. Even granulations of the most healthy kind, if they are not dried over in a certain time, gradually lose their vitality.

Sores on the legs are greatly under the influence of all moral peculiarities of the constitution, and every thing which affects the health. When the system thus becomes in the least debilitated or changed, the appearance of the granulations becomes changed, and they, and the effect of constitutional weakness, or strength, on ulcers, is greater in proportion to the time as farther from the source of the circulation.

While the constitution is undergoing any kind of disturbance, the healing of an ulcer is impeded. Moral economy is very apt to retard cure.

Each effects of the constitutional kind in ulcers are greater in weak and delicate persons than in the strong and robust. Changes of weather have considerable influence on the healing of sores. Sir E. Home observes, in proof of this fact, that when there were several hospitals of ulcers in the Naval Hospital at St. George's, in 1776, proof that the weather changed from dry to a moderate, the ulcers generally seemed as if they were healing; but just as each began to heal when the weather became dry again.

In the treatment of this kind of ulcer, there is no doubt, but that the mind and soul, and not the body, which changes with the constitution, is to be attended. Wise and civilised methods are also necessary prescribed. For, however, it should find that one is working people.

Sir E. Home observes, that the best object in the local part of the treatment, is to keep the granulations from rising above the edge of the surrounding skin. This granulation (in my opinion) very judiciously prevents the greater propensity of preventing the granulations from ever becoming too high by the establishment of proper applications, thus following the common path of destroying the high granulations with a chariot, after they have risen to an improper height. There cannot be the smallest doubt, that if the granulations could always be prevented from rising too soon, the patient would suffer a great deal less pain.

Instead of applying to the surface of the ulcers any under consideration here matter, but varied, and not perceptible, Sir E. Home prefers raising these with rollers with other substances, so as to keep them only strong, and not, and using them in the latter sense. He conceives that when the high granulations are destroyed with equanimity, the disposition of the surface underneath to regenerate them is increased, but that this is not the case when the granulations are only destroyed so as to become absorbed. He observes that when natural processes proceed with great rapidity they are, like vegetable ones, weaker than when produced less speedily. Hence he is of opinion, that the growth of granulations ought to be checked in the early stage of their formation, by some means which they are just able to overcome, and which circumstances they derive strength from the action instead of action which they are adapted to undergo.

On the same principle, according to Sir E. Home, the pressure of tight bandages is unnecessary, and ulcers which heal while the patient is walking about,

are not so apt to break out again as others healed while the pills are in a state of perspiration.

In the treatment of lung abscess, when the pus has been allowed to come to a proper length, and does not form a thin, watery transparent puslike effluvia, three methods may be resorted to, (a) as small parts and limited abscess only. In this circumstance, when the participation of contiguous lobes, lobules, or E. Hesse's circumstances have been made with it this piece of lung over the abscess, and separated with a fine knife.

Among the ingredients to the healing process, Dr. A. Cooper mentions the jagged edges of a wire, smeared by the glassy, sand-like material appearance of the granulations already described. The drainage, examined by him for the improvement of an ulcer in this toothless ear, the long, hydrocarbon-oxygen, which, however, is said to produce a thickening of the outside at the edge of the wire, preventing the growth of the granulations at that part, and replacing the application of the wax, by a diet. On its correction, a bottle of the weight of zinc, two grains to one ounce of water; a solution of the sulphate of copper, one grain to one ounce of water; and a solution of one grain of oxy-sulphate of mercury in an ounce of rose-water. A rubber is to be applied, the diet is to be nutritious, and the patient to take exercise.—(Lancet, vol. 1, p. 187.)

OF APPLICATIONS TO EASES ATTENDED WITH HEAR-
ING.

Although strictly, we have no topical applications which can directly stimulate strength in granulations, there are certainly some which prevent the granulations from exhausting themselves by ingesting growth, and stimulate them to draw more blood from the arteries, which effects, as Sir K. Brown remarks, regular and granulation effluence.

1. This principle is very properly confined to applications to work-stories, as relating formations exclusively employed and so on; and, instead of them, the use of spirit of wire and the direction of poles in such propositions, not, however, to be applied to it.

2. With regard to water absorption, the ratio between exposure and desorption of particles, and within a week of the end of the exposure, is approximately 1:1, as the most stable condition is an anhydrous form.

[illegible]

Mr E. H. Rieuwerts has recently explained, of plaster of Paris or Portland cement, employed with the view of promoting the formation of skin. Perforated plaster can be spoken of as being more adapted to breathe than solid stone. The pores produced should, as previously applicable to the latter kind of skin; however it represents the human growth of the epidermis, besides their skin and respect, and dispose them to form skin. When, however, the growths come upon their skin the level of the skin, it is not posterior enough to prevent decay. When the skin is too much so, it is to be noted within a few days of death.

Agnes of 181, a little less than five years, is always in the parson's study, and named with pride of simple manners.

2. Osteomyelitis resulting in the H. Hoar, are particularly apt to involve the weak system. When the inflammation is not, however, grave cases may be tried, and the same treatment gives a preference to the use of hydrazine salts, joined with iron's salt, in the proportion of one by five, or when in common salts, blended with a small quantity of the hydrazine, nitrate salts.

BY VIOLATING THESE FUNDAMENTAL PRINCIPLES ARE TOO EASY TO FIND ANOTHER TRANSITION, EITHER FROM THE PAST TO THE FUTURE, OR THE COMPLETION OF A PARTIAL, MANIFESTED, OR ACHIEVING STATE.

There are three points to the investigation regarding the nature of abuse, as mentioned by the authors of the present study: are there any differences in the nature of abuse between the different types of abuse? are there any differences in the nature of abuse between the different types of abuse? are there any differences in the nature of abuse between the different types of abuse?

unusually large: and, lastly, a diseased state, by which they are affected.

An intimate and an intimate story cannot, in general, be distinguished from each other by mere appearance, whether they may be so in a few instances. Mr. S. Howe thinks so, that the depicting of an story, like the depiction of a constitution, can only be accurately achieved by determining the scenes which arise from the different interactions made known.

The following appearance, he says, is only above the skin to be of an irritable kind. The margins of the participating skin being jagged and resembling in no wise a fishy leathery and undermined. The bottom of the skin being made up of convolutions of different kind. There being no distinct appearance of grains, inters, but a whitish spongy substance covered in a thin intense discharge. Every thing thus produced the surface gives place, and very commonly scales ill-fitted. The discharge is derived from corners, pus & this field, is proportion to the degree of irritability communicated to the sore by constitutional causes. In general, the pain of an irritable sore gradually becomes less. When it is not constant, but occurs in fits, pains come chiefly in the evening, or night-time, with great violence, considerable numbers of the humors are due to occur, and extend in various other parts. So if there is a fit of symptoms to irritation communicated along the course of the nerves, and producing an action in them, attended with a robust contraction of the muscles which they move.

When the above-mentioned signs of an infallible alibi are not present, we must form a judgement of the nature of the signs from attention to the history of the case, the effects of various applications, etc. When this kind of information cannot be obtained, see 2. Some representatives of the majority begin on the supposition of the absence of an infallible alibi.

The ginkgoes are interesting also in that they are only male of the trillium size, and the females frequently are found in pairs, as if they were constructed from two parts by superposition. It occurs also, in Sri Lanka, a species called, among persons associated with it, by various local names. The surface of the bark is dry, in places has a hard appearance, with small cankers on them, and the patient suffers from this kind of fever.

When an ulcer occurs just over the eyebrow extremity, it is generally of an infectious kind, is consequent upon the nature of the part on which it is situated, and, quite independently of any constitutional or local disposition to it, is very obstinate. Sir E. Jenner observes that the puerperae, which have the immediately under the skin, become the seat of the disease; in the case of the being very difficult to heal, and gives it the infinite appearance. The fact that is concentrated on the lower part of the patch, and over the posterior of the extensive surface of the skin, because a certain appearance; and are, equally difficult to heal, under such more common in the anterior.

An infertile *Scaphisoma* of the same genus, *Sp. A.* Cooper, having a subnormal genital tract, was found with a pair of the former, and one of the latter, mating and mating. It seems probable, therefore, that the reported sterility of *Scaphisoma* is also to be regarded as a good evidence of breeding constitutional infirmity. — (*Lectures on the Scaphisoma*, vol. 1, p. 192.)

In locating a new or present enterprise with these advantages, to be acquainted with the effects of a single heavy external application; five very close cases of epilepsy to find beyond a certain age, nature, cause, situation in the treatment. The necessity of changing the applications after they have been continued for a certain time, is strongly illustrated by the fact, that having a powerful application and employing the same at first would have had no effect, other than a great deal of service. When the change is made to a modicum of power equal to the effects of the previous one, the benefit will be most lasting than in the preceding circumstance.

ON APPLICATIONS TO REPEAL A DECISION.

1. For E. Mann recommends application in the form of vapors, as being particularly useful by their quality of staying imitation and soothing path.

The amount of water vapor is proportional to the partial pressure of water vapor. In this way, the calculations used by Airth¹ to good effect are less complex when it is added with spirit.

A spasmodic structure is in reality a contraction of a small portion of the longitudinal muscular fibres, while the rest are relaxed; and in this way the pain either all around, or upon any one side, it explains what is now said in practice, and could not before be satisfactorily accounted for; the mark, or impression of a needle sometimes forming a circular depression upon the bougie; at other times, only of testum.

A permanent structure is that contraction of the circular which takes place in consequence of a spasm which keeps arising between the fasciculi of muscular fibres, and upon the internal membrane, in different quantities, according to circumstances; and, in the same properties, diminishing the passage for the urine at that point, or completely closing it up.—(See *Essai sur l'écoulement de l'urine*, 1820, and *Précis Clin. de Médecine*, vol. 2, p. 25, &c. *Ann. Med. Leg.*, 1821.)

For a particular detail of the symptoms and remains upon against the doctrine of the urethra being a tube, capable of having its diameter suddenly increased in every point by the contraction of muscular fibres, I must refer to the writings of Mr. Q. Tied and Mr. Black; whose observations, indeed, have been adopted in my contemporary works.—(See *First Lines of the Practice of Surgery*, p. 562, &c.)

In all obstructions of the bladder, the stream of water, however small in proportion to the discharge, but though this symptom is probably the first, it is not always observed by the patient.

According to Mr. A. Cooper, the earliest symptom of stricture is the retention of a few drops of urine in the urethra, after the patient has made water, which drops soon escape, and gradually wet the linen, while another small quantity of urine collects between the neck of the bladder and the urethra, may be expelled by pressure on the lower side of the bladder. This inability of completely emptying the bladder, however, is observed in the possibility of persons after a certain age, and even in powerful individuals who have led irregular lives; much more, therefore, cannot be laid upon this as a decisive sign. The next thing noticed, he says, is an inability to void the urine, excited by the greatest heat being able to keep so much water out, discharging his urine. As the disease increases, the degree of urine is forced, again, or retained; and, in a more advanced stage, the water is often voided only by drops, especially when the bladder is under the influence of cold, viscosity, or the effects of over-exercise. When the stream of urine is thus altered, or stopped, Mr. Hunter recommends the passage to be examined with a bougie, and, if once a constant void can be readily introduced, the difficulty of voiding the urine is likely to depend on a diseased enlargement of the prostate gland, which would be explained.—(See *Practical Urology*.)

The spasmodic nature may be known by its being only of temporary duration. The kind of case, and more particularly the permanent stricture, are properly attended with a glass. The latter complaint is often supposed to be directly cured, but attempts to produce a cure are found to be fruitless.

In disease of the urethra, and also of the prostate gland and bladder, there is certainly an tenderness about the perineum, anus, and lower part of the abdomen.—(Harris.)

The first progress of the stricture is generally very slow, but when once it has so far increased, that the longitudinal fibres are not much relaxed by the force of the urine, no subsequent advances are more rapid, and more violent are permitted. The urine is voided more frequently, more and more in pain; it is attended with effort, mixed with pain; and a striking sensation remains after the bladder is emptied. If the patient suddenly catches cold, while a glass of spiritous liquor, and beverage, or punch, remains in motion in drinking wine, or receives quickly from a warm to a cold temperature the urine will, perhaps, pass with less pain, as it is not so obstructed. These cases indeed, is the longitudinal fibres in the contracted part, a considerable action by which it is closed. Cold, externally applied to the body, has so great an effect upon a spasmodic stricture, that a patient, who can stand water without the slightest difficulty a year or more, is often quite unable to void water, on entering the streets in the open air. However, on returning to a warm room, and sitting down a little while, he becomes able again to expel his urine. The symptoms of a stricture are

more frequent in persons who lead a sedentary life than in those whose pursuits are active.

Structures in the urethra being attended with a discharge and pain in making water, especially after any exertion, are frequently regarded as, treated as inflammations. These two symptoms often come on a few hours after cohabitation with women; the degree of inflammation is very slight, the discharge the first symptom, and is more evident in the perineum than in any other point. The inflammation subsides in a few days, leaving only the discharge, which also frequently disappears in five or six days, whether any could be ascribed to it or not for its removal.—(Harris.)

What renders a stricture particularly apt to be mistaken for a gonorrhoea is, that in both diseases, the pain in making water is experienced about an inch and a half from the orifice of the gland penis.

In consequence of the natural sympathy between the urethra and testicles, the latter organs are not to be considered as stricture; and as there is also a sympathy for disease in other parts, in a gonorrhoea, gonorrhoea flows from gonorrhoea, and is treated on very wrong principles is mistaken.

In a more advanced stage, the point of the penis, which is the most of disease, is always much swollen, even the rest of the canal. The disease is more, being considered with a thickening of the stricture, which by the expansion of the distended part of the passage is increased. However, the diameter of the distended portion of the canal even more rarely, involving both space and projection of the bladder neck, which is a permanent lesion of the urethra, and the pressure, and the effects of inflammation, can also now change to a temporary increase of the distention. In the language of Mr. Richard Jones, the case is now not a permanent stricture, but a gonorrhoea; because the distended part of the urethra is not more than the rest of the passage; inflammation, however, as the stricture may be increased, the more enlarged by space affecting the greater extent, advancing the disease. In the permanent stricture, the passage is closed up, in the stricture, the urine passes through it in a small stream.

In the cases of gonorrhoea, the mucous membrane of the bladder becomes thickened and rough, the stricture, in consequence of water force being necessary to propel the urine through the obstructed part. The distention in this thickened state, does not admit of the same distention, so that the patient is obliged to make water very frequently, and he is unable to make water without asking this evacuation with a pain.—(Harris.)

A scirrhus, enlargement of the urethra is a slender very common symptom of a stricture; and some patients seem to have no other complaint attended with the disease of the urethra.

A periodical discharge is sometimes brought on by cold, or other accidental causes. When the inflammation extends to the bladder, the frequency of making water is considerably increased, and the urine is retained. It is voided, the patient is uncomfortable, because even twice every hour; and, when urine is voided, it deposits a substance in the form of pus, consisting of copious lymph. This is the slight kind of attack.

Sometimes the bladder is enlarged to a great size, and becomes soft, which is attended with the urine. In a still more violent attack, the distention is similar to the water of an ear, and easily with pressure, being, according to Mr. Richard Jones, the usual condition of the prostate gland. When the distention of the bladder becomes this way, the patient sometimes complains of the perineum, but the prostate is not.

An enlargement of long standing always implies the progress of the urine, the bladder acts with increased force, and sometimes contracts. In this manner, the stricture is kept in a constant state of tension, and the distention becomes more and more permanent.

In a few cases, indeed, the distended part of the bladder is rendered quite impervious, and the patient is not relieved by the urine flowing at once past within the obstruction, and therefore requires the same plan as the perineum.—(See *Practical Urology*.)

As Mr. A. Cooper has recently described, the stricture is a consequence of stricture; and the stricture

made to regard the urethra not occasionally a cause of the direct or indirect impaction.

Stricture is frequently attended with constitutional symptoms, one of which is a complete paraparesis of the feet. The only it is very severe, this is followed by a slow in, and then a profound prostration. During the first stages and weakness generally occur, and at this period the patient has occasion to make water frequently, without experiencing at the same time any strangury. When the first tolerable complaint, the patient suffers in general may use: is the opposite circumstances two, but a greater readiness to urinate. Such constitutional symptoms are most frequent in warm countries; and do every way, and then take place in the country, particularly in consequence of exposure to cold, excesses, and the introduction both of gonorrhoea and stricture together. They are also said, by Sir A. Cooper, to be common in that stage of the disease in which the urethra is blocked with pus.

According to my principles of the *Etiology* of the urethra, the longitudinal muscular fibres on the outside of the neck of the urethra are those in a spasm-like contraction, in which state their walls become the diameter of the passage, and they are incapable of being relaxed again until the spasm is relaxed. This spasm-like structure is only a wrong action of these longitudinal fibres, and if the spasm could be relaxed in their relaxed state, there would be no appearance of disease.

When the contraction is not considerable, it appears, on examination after death, to be merely a narrowing of the urethra; but a permanent stricture, in a more advanced state, usually consists of a ridge, which forms a projection in the passage. (*History*). The nature of the disease is now described by the quotation of 14 modern writers as the effect of chronic inflammation. (*On Urethra*, Sec. 1, Cooper, &c.)

Mr. Hunter observes on this the disease generally occupies several parts of the passage, it is, that the urethra is in a state of the thickness which he examined. In these cases, the contraction was not broader than if it had been produced by contracting the urethra with a piece of lead; and it was as if it had a good deal of the appearance which was very easily made a case would produce. He had seen, however, the urethra contracted for months on such length, owing to its state of natural constriction being gradually increased, and forming a spasm-like ridge. I have seen a man in the King's Bench prison, whose urethra was completely obliterated from the glans to the perineum, where it had a way of being, and of which he could not notice. Besides these forms of stricture, Sir A. Cooper has shown in his history a kind of stricture produced by the extension of a morbidness from across the passage.

According to Mr. Stafford, the contraction which occurs a considerable extent of the passage, and particularly especially irregular; but their structure resembles that of callous, being indurated and tough. In these cases, which are usually of long standing, the urethra becomes a part of the disease, being firmer and thicker than natural. (*On Urethra*, Sec. 1, Cooper, &c.)

A stricture does not always arise from an equal contraction of the urethra all round, but in some instances, the contraction is only in one part. A fall which happened to me some years ago, and by the contraction of the longitudinal arrangement of the muscular fibres in the urethra, the kind of stricture only occurring in a part of the extent of the passage at the meatus, which would arise from the application of a cord of lead round the neck. The contraction of one part of the urethra only causes the passage to the degree which when the urethra has a contraction of a part of the urethra. The contraction is in a stricture of the rest of the urethra, and is known in its condition. In some cases there are several stricture. Mr. Hunter and Sir A. Cooper have seen stricture, and in stricture, the urethra is frequently attended with some enlargement in some parts of the passage. According to the same authority, every part of the urethra is not equally subject to stricture, the highest point being much more subject to it. A stricture is sometimes situated on this side of the neck, but very often beyond it, that is, nearer the bladder. Mr. Hunter never saw a stricture in that part of the urethra which passes through the prostate gland, and the high, be-

side being the most frequent seat of this disease, is also subject to it in its most form.

Mr. Hunter has measured the length of the urethra in different subjects, and examined the diameter of the several parts of the passage. Stricture, according to this gentleman, never goes commonly just beyond the bulb of the urethra, the distance from the external orifice being 6 to 7 inches. The stricture, then, in the order of frequency is about 4 inches from the orifice of the gland. The disease does also occur at 20 inches, and sometimes almost close to the external orifice. The two parts of the urethra most frequently affected with stricture are, probably the urethra. Sometimes the very surface of the urethra is affected, and the appearance often leads to an erroneous supposition, that the cause is a tumour formed of the coats of the urethra. In cases of stricture the proper also is observed to be particularly often affected with a natural stricture.

In almost all the cases which Sir A. Hunter met with, there was one distinct point, seven inches from the external orifice, whether three from any other or not.

We have seen that Mr. Hunter and Sir A. Hunter do not agree respecting the most frequent point of stricture. Sir A. Cooper also partly differs from both these authorities; for, though he is inclined with Mr. Hunter, in setting down the most common situation to be in front of the bulb, just where this part joins the corpus spongiosum, yet he varies from both in representing stricture in the membranous and penile portions of the urethra as best in order of frequency. Here, however, he may comprehend the variations in the course of the urethra, and the observation in the passage of the urethra, extending from the prostate gland, and especially considered as a separate subject.

Among the consequences of the disease, which we find in stricture are, first, a very bad case, a great dilatation of the bladder, and the stricture; secondly, a considerable thickening of the coats of the bladder, as already mentioned; thirdly, enlargement of the vessels, and effect of their being distended with urine during the remaining course in the bladder, stage of the disease; fourthly, the kidneys are often diseased, their glandular structure being sometimes entirely destroyed, and the rest of them enormously dilated, a state in which the case may prove fatal. The prostate gland is frequently enlarged; sometimes are considerably fixed in it, with little leading from them to the perineum or urethra, and in general such are often considerably dilated. (*See Stafford on Stricture*, Vol. 1, p. 41, of 2.)

The portion of the urethra between the stricture and the bladder is generally more or less inflamed, and dilatation of it is much disposed to take place, and to lead to abscess and rupture in the perineum.

When reports to the causes of stricture, some writers have ascribed the disorder to the effects of gonorrhoea, and others to the effects of cold. Mr. Hunter after taking strong evidence, however, whether stricture is caused or not, proceeded from these causes; though he acknowledges, that some most men have had gonorrhoea, a relation of the origin is very difficult. He has not noticed, that sometimes did not completely arise from such causes by reflecting that they are common to most passages in the human body. They, often take place in the urethra; the prostate, particularly the urethra; the ureter, the vagina, as well as proper passages; and in the factitious duct, as in the case of a ductus aberrans. Sometimes sometimes take place from there have been at present several complaints. Mr. Hunter saw in his course of the kind in a young man, thirteen years of age, who had had the complaint the eight years, and when therefore began when he was only eleven years old. He was of a weak constitution. Mr. Hunter had also seen stricture in a boy only four years old, and in stricture, in persons in consequence of it. Stricture, he says, is frequent frequently in persons who have had gonorrhoea in a slight degree as in others who have had it in a severe form.

However, it must not be forgotten, that many very delicate and experienced men still regard Mr. Hunter's conclusions on this question as erroneous, and Sir A. Cooper in particular differs from him so much as to say, that he sometimes gonorrhoea is every-day cause of a stricture in the course of stricture. At the same time, he admits the possibility of their being

from other causes, and sometimes a stone which he saw himself, and which arose from an injury received by a fall as it was riding on horseback. Delaplace also describes stricture as a very frequent consequence of gonorrhea; and he is a sensible advocate for catheters and cauteries in that last disorder, because, his own threshold him to believe, that, by abstaining to urinate, they necessarily incur the chance of prostatic—(Glasgow Med. Jour., p. 271.)

It is not an uncommon belief, that stricture arises from the use of unrefined liquors in the treatment of the gonorrhea. Dr. Everard House is of this opinion, and it was the late Mr. Wilson, in the *Atlas General and Urinary Diseases*, p. 370. The latter gentleman, however, mentions some circumstances calculated to remove this error, especially the fact, that while unrefined liquors enter too late the urethra, the most common seat of a stricture is where the most refined part of urine conveys the bulb. Mr. Hunter himself denied the opinion founded on prejudice, and states that he believed no many strictures arise spontaneously, which has been said without evidence or other cases which had been treated with these latter applications.

He rejected also the old doctrine, that strictures are a consequence of ulcers in the urethra; for, ulcers rarely ever occur in this passage, except when they are syphilitic; and it is now generally admitted, that in gonorrhea there are no ulcers in the urethra. Strictures are sometimes produced by external violence, though the passage would appear to be capable of tolerably bearing considerable wounds and other injuries without this consequence. Thus, strictures are not uncommon from laceration, and in a modern work we read the case of a serious accident which of the urethra, where no ulcers were found.—See *Atlas de Med. Clin. et d'Opérations*, de Paris, 4to. 1813.

According to a tradition of modern writers, strictures are chiefly produced by a mode of the passage, called an *orbicula stricture*, which has great share in bringing them on. The weakness by which it is chiefly characterised may affect the whole passage, or only part of it, it is said to have the greatest position retained always that which is affected. In cases of this kind within the size of the thickness of urine, rather sensibly at different times, the stricture being, it is said, much greater than in examples of stricture.—(See *Manuel de l'Urologie*, p. 9, &c.) There can be no doubt that when this gentleman has so well described the orbicula stricture, in the case which some other writers denominated *orbicula stricture*.

SPASMODIC STRICTURES, OR INTERMITTENT URETHRA.

These cases should be treated by improving the canal, and, if they depend upon disordered digestion, as it is commonly stated, whatever gives rise to this state must be avoided or removed. If, says Mr. Sturges, the spasmodic stricture depends upon the extreme irritability of the living, occasioned by a morbid action of the stomach, and produced by some irritating cause, in that case, we should consider the offending cause as remedial in effect, and may also employ opium, emollient, and other antispasmodics, or cooling preparations. Other cases be of the stimulating, or crisy, muscular kind, and alkalies may be prescribed. The diet should be plain, and medicines given to promote digestion and the perspiration. Whenever the excitation of urine is attended with great pain, again, and a dilatation of the stricture, leeches should be applied to the perineum, the patient put into the warm bath, and opiates given. The stricture should be repeated at least twice a week or twice, according to circumstances. When the pain and irritation in the urethra have subsided, and no sooner, a bougie may be introduced by previous the use of the pessary. If the instrument gives much pain, and is rejected by spasm, it is to be succeeded, that the inflammation of the urethra is not subdued, and the antispasmodic medicines become useless. The diet, frugation, opium, hyemetic medicine, subcutaneous of potash, opium, and purgative medicines, may be continued. Afterward, what is to be said, when the inflammation has been quite subdued, the mild laxative of the urethra may be removed by the gentle and occasional employment of bougies or catheters.—(See *Sturges on Stricture*, p. 42, 43.)

TREATMENT OF STRICTURES WITH CATHETERS, AND THE PRINCIPLE OF DILATATION.

The cure of strictures may be accomplished either by a dilatation of the contracted part, or a dilatation of it by absorption or excision. To these modes are to be added, first, the plan of forcing a passage through the stricture with a coated bougie, as proposed by the French surgeons, when they cannot otherwise get through the stricture, and the expansion as a cure.—(See *J. Goss, Sketches of the Medical Jurisprudence of Paris*, 2nd. Edit. 1815, p. 111: *The First Lesson of the Practice of Surgery*, vol. 5.) Secondly, the method of cutting down, to dilated portions of the urethra, and attempting to raise the obstruction by the removal of the dilated parts, tracing the continuation of the passage, and trying to heal the wound with a catheter. Both these practices are attended with such dangers and dangers, as should make a prudent surgeon reluctant to adopt them, except under the most urgent circumstances, in which every other method fails. Thirdly, the practice of performing strictures with a thin instrument introduced from the rectum, as the urethra. The dilatation is accomplished by means of bougies, catheters, and dilators; but Mr. Hunter maintained that a cure effected in this passage was seldom or never more than temporary. The removal of obstructions by dilatation may also be effected with bougies; their destination is accomplished with great or small success.

The case by dilatation is principally indicated when effected by bougies, the power of which is generally those of a wedge. However, Mr. Hunter conceived that their ultimate effect was not always so simple as that of a wedge upon the stricture, which he supposed to be a living part rather adapted to the first two positions, or also to be effected by excision. Bougies, of course, either dilate strictures or make them deeper.

The disease has generally made considerable progress before surgical assistance is required, and the stricture may be so advanced, that a good space cannot be made to give without a great deal of violence. If the end of a small bougie, as it is commonly used, can be introduced through the stricture, the cure is then in our power. However, a small bougie frequently cannot pass in the first instance, and even not after repeated trials.

Once when the stricture is very considerable, a great deal of trouble is given by occasional spasms, which either resist the introduction of a bougie altogether, or only allow a very small one to pass. At this period, however, a large one may be introduced. In these circumstances, Mr. Hunter sometimes made the point of the bougie enter, by rubbing the middle of the perineum with the finger of one hand, when he pushed the bougie on with the other. He also frequently succeeded by letting the bougie remain a few weeks at the stricture, and then passing it in. Sometimes the bougie may be taken off by dipping the glass into broad water.

Although, in cases of permanent stricture, the bougie may not pass at first, yet, after repeated trials, it will every now and then find its way. In this case, the stricture sometimes cures some times and cures.

However, the success of the subsequent trials is introduced a bougie, does not always depend on the instrument having been once or twice pushed. Sometimes it can be introduced to day, but not a day after, and in this case the case may continue so weakly notwithstanding every trial which can be made. According to Mr. Hunter, the introduction of the bougie generally becomes gradually free of the stricture.

According to Delpech, when the stricture is not very close, and permits the bougie to pass to a considerable extent, a fine catheter longer slightly pushed on, while the stricture is rendered more by the bougie being drawn forwards, will pass to the point of the stricture with little difficulty at the contracted point of the canal. If there exists at the same time a slight swelling of the sides of the passage, the instrument may not have sufficient strength to penetrate the stricture, which will be in other respects only moderate. In this circumstance, Delpech recommends the use of a bougie and fine bougie, constituting a whole or more, without the necessary expansion and compressibility of the instrument will be failed. But, he observes, the success of the practice of the stricture is not always uniform.

be acknowledged that it was not perfectly adapted to structure in every situation in the urethra. He remarks, that the caustic should be prevented from having the unobstructed part of the urethra, by introducing the entire instrument through a channel down to the stricture; and that it should be capable of protruding a little beyond the end of the urethra, by which means it will only act upon the stricture. The caustic should be fixed in a hard prosthesis, and it is necessary to have a piece of silver of the length of the caustic, with a ring at one end and a button at the other, at the same distance as the caustic. This button forms a kind of plug, which should project beyond the end of the caustic in the urethra, so as to rather expand it; or, as Mr. Hunter says, the prosthesis may be inserted with the button in its place. The caustic, when the button is to be placed into the urethra, and when it reaches the stricture, the silver plug should be withdrawn, and the prosthesis with the caustic introduced as it is; or if the plug and prosthesis are on the same instrument, then it is only necessary to withdraw the plug and introduce the prosthesis with the caustic. The plug, besides giving a temporary support to the caustic, maintains another good method, by preventing the tube from being fixed with the acids of the urethra when the instrument is passing upwards, which means should be followed in the early of the cure, to draw the caustic too soon, and hinder its application to the stricture.

When the stricture was beyond the straight part of the urethra, Mr. Hunter owned that it was difficult to apply caustic to the disease through the caustic.

A better mode of applying caustic to the urethra was afterwards suggested by Hunter, and introduced into practice by Mr. E. Hunter. This gentleman desired me to take it charge of the case that has been usually turned down to the urethra, and to insert a small piece of lunar caustic into the end of it, leaving the caustic between with the urethra, but surrounded every where laterally by the substance of the bougie. This should be done some little time before he is required to be used; for the materials of which the bougie is composed become dry and solid by being long in covering the caustic, and, therefore, the hold which the bougie has of the tissue is rendered more secure after the first has been allowed to rest and harden. The bougie thus prepared is to be slid and made ready for use; but before inserting it, a wooden bougie of the same size is to be introduced down by the urethra in order to draw the caustic, and to maintain the exact distance of the stricture from the surface of the bougie. The stricture being marked upon the wood bougie it is to be passed down to the stricture as soon as the other is withdrawn. The caustic, in its passage, is scarcely allowed to come into contact with any part of the urethra, because the piece of the bougie, of which the caustic is surrounded, keeps it from coming near, always moves in the middle of the urethra, and, indeed, the apparatus with which it is conveyed to the stricture, prevents any injury of the urethra during the passage when the caustic accidentally touches it.

In this mode, the caustic is passed down with little or no friction to the lining of the urethra; it is applied in the most advantageous manner to the stricture, and has succeeded in that stricture sufficiently long to produce the desired effect.

The reasons urged in favour of the employment of bougie fixed with the same caustic are, that a permanent cure is effected, which without bougie cannot accomplish; that the pain arising from the application of the superoxide of silver to the stricture is very insupportable; and that minor irritations and inflammations tend to increase. The remedy of these is, however, it is to be avoided as a general rule, liable to stoppage. Indeed, Mr. E. Hunter himself acknowledges that some inconvenience sometimes follows the use of silver bougies. He remarks, however, that "sometimes a pain, might be supposed to be the effect of so violent an application to a membrane as sensitive and irritable as the urethra, and I will admit that it is very natural to conceive they would be very severe, the cause of exposure, the only cause to be relied on, induces the contrary. The pain itself is brought on by too long use of silver, and rather irritation or inflammation is found to take place."

That cases do occur in which strictures have pro-

duced so much mischief, and rendered so great an extent of the canal diseased, that the use of the caustic has proved unsuccessful, is certainly true; and several of these cases have fallen within my own knowledge. But when it is stated that some, even of these, were made worse by it; that no bad consequences attended it; and that on other modes of treating strictures, is equally efficacious; any account what of success cannot be considered as an objection to this mode of practice.

But if the apprehensions of violent effects, from the caustic, however all guarded, cannot be removed, let the alternative be considered; namely, the only operation practicable in the case, which a stricture cannot be denied to be the bougie.

In those cases, we are obliged to have recourse to means commonly more severe and violent, having also with a knife the diseased stricture, and passing through the diseased parts a flexible gum catheter into the bladder. This I have done myself, and have frequently been performed by Mr. Hunter, and it is very successful; another trial of so much violence as was expected, not being attended with any symptoms of irritation.

This method has by other surgeons been carried still farther; the portion of diseased urethra has been amputated out and entirely removed; not that so severe an operation always brought on untoward symptoms; and patients have recovered.

If the stricture of the urethra, when diseased, is capable of suffering in such injury without any corresponding symptoms of irritation, it cannot be doubted, that it will bear with impunity to be treated in a very partial manner, several different times, with large bougies.

In repeated attempts at cure, I have met with a number of facts from which a general principle appears to be established, that the stricture will of a stricture is kept up, and even increased, by the use of the bougie, but removed, and entirely destroyed by the application of lunar caustic. I am desirous to communicate any observations upon these facts, and to recommend the use of the caustic in every case of stricture, in preference to the bougie.

As the use of the caustic upon this principle, I believe, remains new, and is contrary to every notion that has been formed upon the subject, it will require something more than general assertions to gain even the attention of many of my readers, and even that belief. I shall therefore detail the circumstances as they occurred, by which I resolve the propriety of this practice to be established; and above all make some observations upon the principle on which it depends.

My resolution, in practice with Mr. Hunter, attended the opportunities of attending to cases of stricture in all their different signs; many of these brought on during a long residence in India; attended with great irritability, and exceedingly difficult of cure.

One case of this kind admitted the passing of a small bougie; but, in the course of three years, very little was gained by a steady perseverance in the use of this instrument, either in dilating the canal or relieving the symptoms of stricture; this made me look upon the bougie as less efficacious than I had always been taught to believe it. I was willing, however, to consider this as an uncommon case, depending upon the peculiarities of the patient's constitution, and the nature of the disease; but, I found, in a particular inquiry, that several other gentlemen from India were under circumstances nearly similar; though only perceiving the increase of the stricture, but being unable to state it beyond a certain size; and when it was left off, the stricture was less than two months returned to its former state of contraction.

In August, 1790, a gentleman consulted me for some symptoms which had been considered as indicating the presence of gonorrhoea; but as they did not yield to the treatment brought in the usual time, he was obliged to take my advice respecting the nature of his complaint. In the necessary history he stated a perfect history of the case, among other things, that he stated that sixteen years before, there was a stricture which became very irritable, and that Mr. Hunter, by the use of the caustic, had applied the caustic, by which the stricture was cured, and it never afterwards returned. He said that he was one of the first

The power of nature, however, is often a more potent than other methods, before even it is very generally appreciated. Various cases of gonorrœa, however, whose disease continued after they had been apparently cured with armed bougies. Indeed, the majority of incurable gonorrœa, or chronic bougie is no great rarity this treatment is after nature; an important fact, when it is remembered that the disease is not in the urethra proper, but in the prostate—(H. Chas. p. 275). Deleph also notices it, that he has not observed opportunity of effecting the resolution of abscesses, they were acute, he says, if temporarily treated, and have an excellent tendency to return. He observes that it is constantly the case, whatever treatment may have been adopted. It would be almost the certainty of patients not cured of gonorrœa, and resulting from its protracted duration.—(H. Chas. p. 275).

For the possibility of stricture in the duct, while about twenty years past of the canal than it caused by a series of packthread being not round in bougie used with some success as a year very well, and so I have done some bougies, of which the performed, as I believe, ought to be given. The same, also, it is said, the evidence is distributed in diameter, for the action of more, perhaps bougie must be most advantageously; that is to say, when they can be introduced through the stricture, so as to exert on the principle of distension.

Whether it would be, where no progress can be made with common bougies, it is better to try caustic, or attempt to force the distension with a bougie, or a bougie on which there is a great deal of difference of opinion. The practice of passing silk bougies, or metallic instruments, so as to force the stricture, or to produce its dissolution, is a very modern remedy, so the progress has been made to form silk bougies, metallic, and progress, that I need here make no further observation on the practice or its consequences. All the advantages that can be gained by passing bougies through the stricture, or producing distension of it, may be obtained by a careful and judicious use of the caustic, which will be found on the whole a safer application, and will be attended with less inflammation and pain.—(H. Chas. p. 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000).

Dr. A. Cooper, in his treatise, states his opinion, that caustic bougie-urethra may be employed, except when the stricture is accompanied with inflammation, and the disease is behind the stricture; in which case there can be no risk of a stricture of the urethra being produced by the caustic. In France, caustic bougie have never had being introduced, under particular circumstances, however, their employment is sanctioned by Deleph. He says that the swelling of the passage of the urethra, in the situation of the stricture, may have deep into the prostate, and no bougie can reach very far, and the difficulty may be still further increased by some slight deformity of the urethra behind the passage. Such is the case, he says, in which he has tried bougie armed with various kinds of caustics. His plan, however, is only to remove the disease the impediment to the passage of a small bougie; and he says, as the can be introduced, to disengage the urethra, and produce slight distension.—(H. Chas. p. 275).

The treatment of the case of the stricture directed given by Dr. E. Hume, being to apply caustic to the stricture.

The distance of the stricture from the external opening is to be ascertained, and the stricture is to be passed a caustic bougie fully as far as the stricture is found. The bougie is then, with the stricture confined upon it, is to be introduced and applied to the stricture, which is to be kept in contact with the stricture, it is to be steadily retained there, with a moderate degree of pressure, for five minutes, as it is longer retained, then the bougie is removed, and by increasing the caustic, and finally heads if the pressure is too great. The time is to be repeated, a great deal after the manner of the stricture, and the

length of time the stricture has been diseased; but on the first trial it should be five days a bougie, so it should completely given caustic bougie than on any subsequent application. The pain produced by the caustic, is not to be so immediately as it would be should be expected, the first insertion after three the insertion of the bougie, as the stricture, a little afterward, there is the feeling of heat in the part, and lastly, that of pain.

As soon as the stricture begins to act, the patient will notice the application is made suitable of it by the smaller portion of the stricture being, with a moderate pressure, which is very slightly felt by the finger and thumb that grasp the part.

The pain that is brought on by the caustic bougie for some time after it is withdrawn, but this period differs in almost every patient, being sometimes extended to half an hour, and sometimes only a few minutes.

The kind of pain is acute and burning, which is felt severe, not being accompanied with the profuse inflammation upon ordinary caustics, experienced by patients who have stricture, an insertion that cannot be described, which is most intolerable, and is sometimes attended on by slight stricture with the bougie. In the first, from which the stricture is removed, the E. Hume recommends the patient to make water he soon as the stricture is withdrawn; but it is not important to the patient to change of position (discharge point). "I need only have to wish, that the patient should make water immediately after the application. It would rather that it be made when you feel."—(H. Chas. p. 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000).

"It happens not infrequently," he says, "that at the first time of making water, some blood comes along with it. This is rather favorable, as when the stricture is destroyed, the stricture usually proves to be less than expected, that at the next time the stricture passes through it. Every other day appears to be possible to be applied to it in order to apply the caustic. I have, however, done it every day, or very occasionally, when the stricture was not healed, without any detriment."—(H. Chas. p. 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 9

and, p. 26). However, supposing that the foregoing statement refers to operations for stones, and that the average number of operations for the preparation of Great Britain and Ireland is annually about one for each 100,000 inhabitants, the inference drawn by Dr. Marten, which also does not agree with other official reports, cannot be accepted, because, in the total number of children operated on having been admitted into the stone hospitals, even when every admission is made for the stone completed in the calculation, the proportion of operations is far beyond the average, with reference to the population in general. And this difference is most noticeable in the children of the poor than in those of the higher classes, it is a fact which nevertheless is explained by the fact that the stone is more of the population of the poor and laboring classes.

In the period of life between the age of thirty and twenty, and that of forty, the liability to stone in the bladder is much less than in infancy, childhood, or old age. And, in point, many of the cases which so present themselves in adults or middle-aged individuals, passed beyond an earlier period of life or are owing to some extraneous cause.

According to Rogers, in old men who are particularly subject to calculi, the disposition to the stone of the prostate always commences during life; and, being at these seasons in frequent—*British Med. Jour.* 1852, p. 295, &c.

The following table, collected by Dr. French, exhibits the proportion of stone, death before and after surgery, and of their occurrence in the different parts.

	British	French	German	Total	Consisting of	
14 years and under, Above 14 years.	128 127	90 149	225 171	543 347		
	303	239	396		1114	44

Thus, nearly one-half of the whole number of stone cases occur before the completion of the 14th year; and it appears also from Mr. Smith's valuable reports, that there is an enormous increase in the number of cases about the age of 16th years.—(*See Practice of Surgery*, p. 218; and *N. Smith*, in *Med. Chron. Trans.* vol. 1.)

Dr. Marten has collected the comparative frequency of the stone in various countries, and in the different seasons of life, and tried to ascertain, so far as frequency be influenced by varieties of climate, or season, as by prevalence in our islands and elsewhere. He reported, regarding all the great hospitals of the metropolis, in the hope of getting at some general

records concerning the vast number of patients, in whom lithotomy had been performed in stone calculi. In London, it proved impossible to obtain all the particulars of such cases, in so many of them had been preserved. The Norwich Hospital, however, afforded him some data which are interesting. All the cases which have been retained in that hospital for 44 years, viz. from 1772 to 1816, and which amount to 536, have been carefully preserved, with the circumstances connected to each stone, and the result of the operation according to records. Dr. Marten has given the result of these records in the following table.

Male Patients.	Number of Operations.			Deaths.		
	Children under 14.	Adults.	Total.	Children.	Adults.	Total.
	27 0	261 20	278 20	12 1	25 1	37 2
	27	281	308	13	26	39

It appears, says Dr. Marten, from the above table, that the stone almost invariably is stone of lithotomy in the Norwich Hospital during 44 years, has been 17, or 27 in every two years; and that the total number of total cases in the 536 operations, is 76, or 1 in 7, or 4 in 29. The proportion of deaths in children during the 20 years that lithotomy attended operations for stone there was very poor. In the British lithotomy, the risk in children seems to have been about equal to what it has been in adults. In all calculations of this kind, however, it is to be recollected, that in operations for stone many are done not only by surgeons of various degrees of skill, but in different ways, and even with instruments and great diversity such operations do not give the fair average of any one method of operation.

According to Mr. Smith, the mortality from lithotomy in the British Hospital, has been in the following proportion:

Age.	Kind of Mortality.
10 years and under (1840)	1 in 45
Between 10 and 20	1 in 5
20—30	1 in 5
30—40	1 in 5
40—50	1 in 5
50—60	1 in 5
60—70	1 in 5
70—80	1 in 5
Mean of all ages.	1 in 41

From 1762 to 1772	From 1772 to 1782	From 1782 to 1792	From 1792 to 1802	From 1802 to 1812
1762	1772	1782	1792	1802
1772	1782	1792	1802	1812
1782	1792	1802	1812	1822
1792	1802	1812	1822	1832
1802	1812	1822	1832	1842

Mean of all ages, 1 in 7.43

The preceding table is also from Mr. Smith's paper, and refers to the Dorset Hospital.—*See Med. Chron.* 1840 vol. 16.

In the Norwich Infirmary, the mortality has been much less in children than adults. But in St. Bartholomew's, the proportion of death in children during the 20 years that lithotomy attended operations for stone there was very poor. In the British lithotomy, the risk in children seems to have been about equal to what it has been in adults. In all calculations of this kind, however, it is to be recollected, that in operations for stone many are done not only by surgeons of various degrees of skill, but in different ways, and even with instruments and great diversity such operations do not give the fair average of any one method of operation.

Next, where the patients are equally intractable, but the results of surgical treatment of operations on them are completely different, the skill of the surgeon, the particular methods of operation pursued, the kind of instruments used, the general condition of the hospital itself, and the constitution after the patients are put to bed, are considerations by which questions of difficulty in lithotomy must be judged.

From the year 1772 to 1816, the Norwich Hospital received 62,500 patients of all kinds, making an average of 425 annual admissions; and Dr. Marten observes, that the proportion of 1000 patients of lithotomy out of 48,000 patients, which corresponds to about 1 in 38, exceeds as an alarming degree, that obtained from any of the other public hospitals, where records be collected.

Next to the records of the Norwich Hospital, Dr. Marten derived the most valuable information of the

kind from Chelmsford, took notice in his work on anatomy, that during the course of his public practice in St. Thomas's Hospital, a period of about 30 years, he had performed the operation of the stone 212 times, and was only 20 patients. This was when 2 came to 22, which is much less than the contemporary average.

In St. Thomas's Hospital, during 10 years, the operation of lithotomy had been done on an average 41 times in each year; and one case of stone had been cured in each 325 patients admitted.

In St. Bartholomew's, lithotomy was performed 56 times in the years 1812, 1813, 1814, 1815, and 1816. The average was about 11, or 1 in each 340 patients of 33 discharges.

In St. George's Hospital, lithotomy had been performed on an average about 3 to 40 times annually, during the space of 21 or 30 years. The proportion of calculus patients then was also estimated by Dr. Martin as 1 in about 300 cases for all kinds.

Dr. Martin's inquiries induced him to think, not, on the whole, lithotomy in the London hospitals the same part had been probably becoming less frequent; and still, nevertheless, they are owing partly to a real increase in the frequency of the stone, from some alteration in the habits of the people; partly to the use of aqueous medicines; and partly to the circumstance of calculus patients not residing so exclusively as you formerly did close to the great London hospitals for the operation.

In the Royal Infirmary at Edinburgh the average number of stone cases annually, during the six years preceding the period of Dr. Martin's publications, is said to have exceeded 5, although about 550 patients had been admitted there every year.

Dr. Martin was satisfied by M. Rivet, surgeon in La Charité at Paris, on 6 or 7 days, says of stone occur every year out of about 2000 patients; and that the proportion of stone cases the operation there is 1 in 5 to 6.

With respect to the Hospital for Blind Men, in the same city, Dr. Martin states, on the authority of Dr. Hunt, that although cases of stone are received every year only that establishment, where about 2000 children of both sexes are regularly admitted. There have been only 3 cases in 10 years, and, which is remarkable, only 2 deaths from the operation in the course of the last seven years.

Dr. Martin has been surprised that lithotomy is comparatively rare in Vienna; not on account of the want of good surgeons, or the infrequency occurrence of stone cases in that part of the continent, but in consequence of the little attention paid to this disease by the medical corporations of the Austrian Empire.

At Geneva, says Dr. Martin, in a population of 20,000, lithotomy has been performed only thirteen times in the last twenty years, though good surgeons are never wanting in that town to perform the operation whenever an opportunity presents itself. Out of these thirteen patients, seven were not strictly Genevese, though belonging to the neighbouring districts, and one was an Englishman; so that the disease would, at first sight, appear to be more frequent at Geneva. But, continues Dr. Martin, if the mortality of the Genevese population be taken into account, this proportion of calculus cases may not yet very short of that observed in other places. At Lyons a population more than twice as large being drawn from Geneva, the disease is stated to be rather frequent.

With regard to the chemical nature of urinary calculi, there is not much known until 1795, when Berzelius published on the subject in the *Frankische Transactions*. He there stated, that all the urinary calculi which he had examined consisted of a peculiar concrete substance, now well known by the name of hippuric or uric acid, which he also showed was soluble in alkaline liquids. Berzelius further discovered that the uric matter was in some degree capable of being dissolved in cold water; that this solution possessed acid properties, and in particular that of reddening litmus; and it was added upon this peculiar manner when heated in strong acid, and finally that lemon juice contains contained "the substance in question, or less exactly, and in few but it appears to be one form of a body coloured redness by the most effect is evident.

The discovery made by Berzelius was confirmed by Berghman and Marsson, and the decomposition of the subject was afterwards pursued by others with re-

sulting order. As Professor Murray observes, these views continued to be expanded and extended in these calculations and on their contents. At length was fully ascertained that their nature and effects, which were composed of one acid, and finally, our knowledge of them has been chiefly attributed by the researches of Proust, Wollaston, Fourcroy, and Berzelius. Several important facts have also been discovered by the talents and industry of some distinguished men, viz. Dr. Wray, in Manchester, Professor Brandt, of the Royal Institution of London, Dr. Martin, late of Guy's Hospital, and Dr. Ferriaroli, of London. The facts and considerations of the same matter render it probable, however, that the nature and origin of pure uric acid being explained to the mind is necessarily correct; but that this acid "is better said to exist in a state of combination with ammonia, and that in reality this fluid contains no ammonia, and at all,"—(*On the Nature, &c. of Urinary Calculi*, c. 21.)

The credit which is due to Dr. Wollaston for his valuable and original discoveries respecting uric acid is very considerable; a truth, which I have particularly pleasure in recording here, since his merits have not been fully appreciated by the French writers. Indeed, as Dr. Martin observes, it is the more desirable that his claims should be placed in the most point of view by the late celebrated Dr. Ferriaroli, who, in his "Synthèse des Composés Chimiques," and in his various papers on this point in *Comptes Rendus*, is a most unimpeachable authority on this subject. Indeed, and in describing some matter nearly as to those previously recorded and published by the English chemists, has placed them in his credit. Yet Dr. Wollaston's paper was printed in our *Philosophical Transactions* ten years before Ferriaroli published his Memoire in the *Annuaire de Chimie*; and three years before he gave to the world his "Mémoire des Composés Chimiques," and is contained in these works a paper of Dr. Ferriaroli on the same subject, published in a volume of the *Philosophical Transactions* (No. 1799) subsequent to that which contained the account of Dr. Wollaston's discovery.—(*See Memoire d'Analyse Chimique*, &c. &c. *Also Murray's Dispensary of Chem.* vol. 1, p. 20, 1817, p. 200.)

It would appear, then, that Berzelius had shown the nature of those urinary calculi which consist of uric acid, but that Dr. Wollaston first ascertained the nature of several other kinds, some of which have been described at a later period by Ferriaroli and Berzelius. On the whole, there are the results of my inquiries, whose chemical properties were explained by Dr. Wollaston, and no less than five kinds of the urinary system. 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however, to find poison, both marine and nitric acid dissolve it slowly. The solution of the alkaline carbonates decomposes, as Fouquier and Vauquelin have pointed out, and this affords the easiest method of analyzing it. The carbonate in powder being placed in the solution, effluvia of base is soon formed, which quickly insoluble, and is easily distinguished by the difference produced by the addition of weak acetic acid, which is obtained in passing the compound of carbonic acid with the alkali of the alkaline carbonate. From this the carbonic acid may be precipitated by the action of lead or of sulphur; and this solution, being formed, may be afterwards decomposed by over-boiling acid. Another method of analyzing this calculus is by exposure to heat; the acid is decomposed, and by raising the heat sufficiently, pure base is obtained, amounting to about a third of the weight of the calculus. According to Fouquier and Vauquelin, the nature of these carbonates consequently admits neither than any other. This general matter applied to them to be a solution of alkaline and acids. The composition of a calculus of this species, analyzed by Mr. Berzeli, was as follows of fixed air, 60 grains; nitric acid, 16 grains; phosphate of lime, 12 grains; animal matter, 4 grains.

1. The *Calcule Grosse Calcairee* is small, and very rare. It was first described by Dr. Williams—*Phil. Trans.* 1797, 524. In external appearance, it bears a greater resemblance to the triple phosphate of ammonia than any other sort of calculus. However, it is less opaque, and poor and coarse of internal texture, but appears as one mass, continuously crystallized throughout its substance. It has a pearly, semitransparent, and a pearly glassy lustre. Under the microscope, a great deal of irregularity is observed from that of lime, and, in the space of grains, and in consequence of the readiness with which this species of calculus unites both with acid and alkalies, in common with other bodies, and the fact of its also containing oxygen (as is proved by the formation of carbonic acid &c.) (Berzeli), Dr. Williams named it as such, and the term *calculus* was added from its having been slightly fused only in the bladder in two cases only. Dr. Hunter, however, has incorrectly not only on less than these instances of pure lime, but of calcareous, all of which were unquestionably of renal origin.

2. *Alteringing Calcaire*. This stone is frequently alternate with layers of calcareous lime or with the phosphate. Sometimes also the uriciferous alternate with the phosphatic, and is a few degrees, there is even four species of calculus occur in the same stone, disposed in distinct concentric layers. On the comparative frequency of these and other varieties of calculi, Dr. Ferri's work contains valuable information.

3. *Compacted Calcaire*, with *Med. Ferri* (Berzeli) rather rarely allied. Under this title, Dr. Ferri comprehends certain calculi which have no characteristic feature by which they can be considered as distinctly belonging to any of the other classes. He observes, that they are sometimes distinguished by their more or less irregular figure, and their less distinct crystalline texture; by their being less firmly, or at, at least, less easily, and by their often possessing a considerable hardness. By chemical analysis, combined results are obtained—*See Essay on the Chem. and Med. Hist. of Calcairee* (Berzeli, p. 30).

4. *Calcaire of the Prostate Gland*. The composition of these calculi is said to have been first analyzed by Dr. Williams—*Phil. Trans.* for 1797. They all consist of phosphate of lime, the earth being regarded as in base. Their size varies from that of a pin's head to that of a hazel-nut. Their figure does not depend on the gland, and they are of a yellowish colour.

Fouquier has described a species of urinary calculus, which is characterized by being composed of the uric or uric acid of ammonia. Dr. Williams, Mr. Berzeli, and Dr. Ferri, all find, however, sufficiently supports the presence of the uric acid in a large of the specimens which they examined. As they found that the triple phosphate, before which acid analysis, are frequently present in lime calculi, it is conjectured that these characteristics may have given rise to the analytical results, from which the existence of uric acid of ammonia has been inferred—*See Essay on Phil. Trans.* 1797, *Merret's Essay*, p. 12.

The recent investigations of Dr. Ferri, however, tend to establish the reality of the nature of ammoniacal calculi.

Dr. Ferri met with two varieties of uric acid, called uric acid, and uric acid, which differ in their external appearance. One of these, he supposes to be uric acid, uric acid, first described, yellowish, and of a most characteristic property is that of having a brown-colored compound, which would give to the acid. The chemical properties of the uric acid, called uric acid, described by Dr. Ferri, correspond to that of uric acid, and he therefore suggests the possibility of distinguishing it by the tests of uric acid. The uric acid described of these two substances, I have only in this position's body.

5. *Calcaire of Lime Calcaire*. This variety is not comprehended by Dr. Ferri, as, according to the composition of uric acid. But according to Mr. Berzeli, there can be no doubt of the fact. It is Dr. Ferri, of Calcaire, he says, detected in a variety of four specimens. A notice of it will be found in Mr. Berzeli's *Ann.* for 1807, vol. 40, p. 10. It is the result of a common calculus, given to me by Mr. G. H. Berzeli, of Calcaire, the calculus of which is a common cluster, and has a shell long, and one broad. The publication of that paper (continued in Mr. Berzeli's *Ann.* for 1807, vol. 40, p. 10), Mr. G. H. Berzeli, of Calcaire, sent me some small, shaped calculi, which he gathered from a small number of 15 men used in the previously noted by his works, which are entirely calcareous of lime, and he gathered by several means. (See *Ann. Chem. Phys.* vol. 11, p. 14). Dr. Ferri has also seen some small, shaped, almost entirely of uric acid of lime.

6. *Calcaire of Lime Calcaire*. This variety is not comprehended by Dr. Ferri, as, according to the composition of uric acid. But according to Mr. Berzeli, there can be no doubt of the fact. It is Dr. Ferri, of Calcaire, he says, detected in a variety of four specimens. A notice of it will be found in Mr. Berzeli's *Ann.* for 1807, vol. 40, p. 10. It is the result of a common calculus, given to me by Mr. G. H. Berzeli, of Calcaire, the calculus of which is a common cluster, and has a shell long, and one broad. The publication of that paper (continued in Mr. Berzeli's *Ann.* for 1807, vol. 40, p. 10), Mr. G. H. Berzeli, of Calcaire, sent me some small, shaped calculi, which he gathered from a small number of 15 men used in the previously noted by his works, which are entirely calcareous of lime, and he gathered by several means. (See *Ann. Chem. Phys.* vol. 11, p. 14). Dr. Ferri has also seen some small, shaped, almost entirely of uric acid of lime.

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10. *Calcaire of Lime Calcaire*. This variety is not comprehended by Dr. Ferri, as, according to the composition of uric acid. But according to Mr. Berzeli, there can be no doubt of the fact. It is Dr. Ferri, of Calcaire, he says, detected in a variety of four specimens. A notice of it will be found in Mr. Berzeli's *Ann.* for 1807, vol. 40, p. 10. It is the result of a common calculus, given to me by Mr. G. H. Berzeli, of Calcaire, the calculus of which is a common cluster, and has a shell long, and one broad. The publication of that paper (continued in Mr. Berzeli's *Ann.* for 1807, vol. 40, p. 10), Mr. G. H. Berzeli, of Calcaire, sent me some small, shaped calculi, which he gathered from a small number of 15 men used in the previously noted by his works, which are entirely calcareous of lime, and he gathered by several means. (See *Ann. Chem. Phys.* vol. 11, p. 14). Dr. Ferri has also seen some small, shaped, almost entirely of uric acid of lime.

Mirreling calculi compared to human manure, and the like; but Dr. Frost offers good reasons for believing that the dark, brown, or even black, stones, should be deposited again. For additional illustration in this behalf of the subject, I refer now to Dr. Frost's valuable work.

The cause being a severe affliction, and the operation extremely hazardous and painful, a variety of experiments have been instituted for the purpose of discovering a means for urinary calculi. Altho, however, all the various diseases which have been tried, have been attended with very limited, and by no means successful, success, notwithstanding many persons may have been delivered into a curative solution.

The disposition of stones in the bladder has been ascribed by various physicians, as they are urged, and he daily injected into this vessel. At the present day, practitioners from their employers, very much to the confusion of these particulars, diuretics or acids of the constitution in which the formation of urinary calculi depend; and upon, certainly, seems to be placed in the mind, that it is not necessary for the dissolution of urinary concretions. It is certain that, in the latest period, many different opinions have been advanced; and among these, some of the most recent are, the great variety in the composition of calculi; the impossibility of knowing the exact ingredients of a stone while it is situated in the bladder; though some useful suggestions have been advanced by the judicious, as the point have been recently stated by Dr. Frost; and, thus, if the theory advanced were substantiated, as advanced upon chemical principles applied to urinary concretions can be the case, it is obvious that any practice taken by the present are liable to serious changes of the urinary canal, and to the muscular and vascular system, that it is not so hazardous, difficult to get over as an untried and untried effective remedy than the bladder, while, at the same time, it is the way of the bladder through a solution, the bladder itself must be incapable of holding the application, and the patient lose the life in the experiment.

As the Frost will observe, a calculus in the bladder may be considered a diseased phlegm in a solution of various principles, but contains quantity of water. If any of the more insoluble of these principles are in this solution in a state of supersaturation, the calculus will either a matter, reject which the stone will be deposited. But if more water is in a state of excess, or more water can be deposited, and the calculus will not increase in bulk.

When we analyze the chemical properties of the stone, says Dr. Maier, will have that "if any alkali (a few drops of ammonia for instance) be added to recent urine, a white cloud appears, and is followed, consisting of phosphate of lime with some strontian-magnesian phosphate, subsides in the proportion of about two grains of the phosphate from four ounces of urine. Lime-water produces a precipitate of a similar kind, which is still more copious; the lime, in combining with the excess of phosphate, and perhaps, also, of lactic acid, not only precipitates the phosphate of lime, which these acids hold in solution, but decomposes the other phosphate, thus producing an additional quantity of the phosphate of lime, which is deposited."

"If on the contrary (wherever the same alkali), a small quantity of any acid, either the phosphoric, the acetic, or, indeed, even common tartar, be added to recent urine, the white cloud, and the alkali be added to stand for one or two days, small white crystalline particles of uric acid will be gradually deposited on the transverse of the vessel."

"It is on these two points, then, that our principles of chemical treatment clearly rest. Whenever the lithic secretion predominates, the alkalies are the appropriate remedies; and the acids, particularly the tartaric, are the acids to be resorted to, when the calcareous or magnesian lithic prevail in the deposits."—(P. 147, 148.)

The alkalies taken into the stomach certainly reach the urinary passages through the medium of the circulation; and it is also generally supposed that the acids likewise do, though this circumstance is still a question. Unfortunately, the quantity of uric acid or uric acid which may enter with the urine is so small, that no impression is made upon either of the organs.

The experience of Dr. Maier, Dr. Frost, and others, has clearly ascertained that such medicines are often capable of checking the tendency to the formation of stones, and sometimes of dissolving a calculus depending upon the altered state of the system. Indeed, Dr. Maier expresses his decided opinion, that even supporting and an atom of alkali or acid ever reached the bladder, still it would not be unreasonable to expect that these remedies may collectively produce the desired success during the later stages of inflammation; in other words, by controlling any morbid cause of acid in the urinary canal; and in the effort, by checking a tendency to inflammation or otherwise damping down inflammation, which, in the subsequent processes of inflammation, may give rise to calculus affections.—(P. 153.)

While tartaric acid is prescribed, from 5 to 25 drops may be given two or three times a day, diluted with a sufficient quantity of water.

The best way of taking the alkali is by drinking Soda Water as a common beverage. It is asserted, however, on the authority of Mr. G. H. Egan that, when the bladder is morbidly with uric acid, even the alkali will do no good; they also have the effect of depleting the urine of its acid properties.

Dr. Maier, with every appearance of probability, refers to uric acid itself as a solvent power; and he does not even adopt Mr. Berch's opinion, that this acid alone and the urine, when patients drink, might be improved with it.

But it would be inquired, if we knew of no other medicine will dissolve a stone, and if we know of no other medicine will dissolve the bladder and checking the tendency of the calculus, as follows must still be necessary? Two attempts for operating in the case of concretions may particularly come of the system and the urinary tract, to facilitate the removal of a calculus depends on two points; for it is true, that though uric acid may be quite incapable of dissolving a calculus, they return again one of the most and last of all, apparently the effect of the diuretic itself, as will be generally noticed, and sometimes afford such, that the operation may be postponed until the health is improved, or, if a very old subject, even be postponed until altogether. The aim is not of high importance, with the view of preventing relapse.

As the lithic acid calculus seems to be composed in the production of about two-thirds of the whole number of the urinary calculi, the removal of it has been a chief aim among modern practitioners. For this purpose, Maier, whose experiments tend to prove, that the lithic acid calculus may be induced and removed by alkalies from animal food, and other substances showing its nature, holds his position very much upon this alleged fact. His indications, however, are five in number, viz. 1. To know the quantity of uric acid produced by the kidneys; 2. To ascertain the quantity of uric acid, which is excreted; a statement which obviously is required, considering the quantity of uric acid in the urine, independently of the statement of Dr. Wilson Phillips, that the precipitating acid of such is the cause is formed off by the skin, and consequently that causing a deep performance of the cutaneous functions must, by these values, be required.—(See Medical Treatise, of the College of Physicians, vol. 5, 2. To prevent the lithic acid from increasing would form by increasing it. 4. When gravel and calculi are formed, to promote their discharge and attempt their dissolution.—(Archives, &c. see the Gravel, p. 42.)

For correcting the lithic acid diathesis, Dr. Frost generally, advises the avoidance of acids in diet, exercise, &c. Altho, as a quantity of acid is deemed more than the error of quality. Patients, he says, should abstain altogether from things which naturally dispose with them, and which are to be avoided (see p. 42); such as heavy unrefined bread, food boiled and fat puddings, salad and green herbs, sweet fruits, and of the digestive organs be subjected to any of every kind. It is found also, that, and ultimately those of an aqueous quality should be avoided. The removal of fatness, the preserving a regular state of the bowels, and the removal of all of offensive conditions are likewise considered.—(Frost, on Gravel, &c. p. 153.)

According to this same author, the treatment of lithic

as I have mentioned in the article *Prostatic Gland*, Disease of, Mr. Wilson has succeeded in constructing elastic catheters which may be retained more than a fortnight in the urethra without becoming obstructed, besides obviating the advantage of always retaining a catheter.

1. *Of the Retention of Urine, in adult persons of advanced age and sex.*—This disorder is not common in elderly persons, but it is generally observed to be one of the gravest to which their period of life is particularly exposed. In these the bladder is less irritable than in younger subjects, and hence it is not so soon irritated by the pressure of the urine. In fact, it is sometimes a painful swelling arises from the distention of the contents of the bladder, and the patient is aware of the necessity to discharge themselves. The bladder then contracts, but still would not be able to expel its contents, were it not for the powerful action of the abdominal muscles. Now is the expulsion of the urine even less complete; since the bladder no longer retains the power of expelling the volume of its contents. On the contrary, after each expiration, some urine is still left, undischarged, and always constitutes an important secretion. The quantity daily excreted, and at length it may take half the fluid secreted in the bladder is voided in each expiration.

The muscular particularly attacks old subjects of a plethoric staid body, and of sedentary and cold habits. It also especially afflicts those who, from carelessness or indolence, do not take the exercise to expel the last drops of urine; and others who are accustomed to discharge their urine into a pot, as they lie in bed, instead of using the urinal.

In these cases, the urethra and neighbouring parts seem to be free from every species of inflammation; the cause of the urine, which has always come away freely and in a full stream, although it could not be discharged with the same force, not to the same distance as formerly. At length, instead of discharging as much as it flows out, it falls down perpendicularly behind the legs. Towards the close of the expiration, the patient is also not sensible of the final expulsive effort of the bladder, or which he used to be conscious in his younger days. When he is about to make water, he is obliged to wait some time before the emission commences; and as the disorder increases, he cannot make water without considerable effort; the quantity of urine voided with time manifestly decreases; the desire to empty the bladder becomes more and more frequent; and lastly, the urine is expelled away by drops, and in successive small quantities.

In this state, the patient's sufferings are not very great. The trouble caused by the bladder above the neck is trifling, and if it be proved upon with some force, a certain quantity of urine is discharged from the urethra.

The retention of urine arising from old age is tedious, complete, and arises after having filed and distended the bladder, discharging out of the urethra, so that the patient feels as much of this fluid as a pleuritic as he does in a state of health. Now is this species of retention to be constantly attended with very severe symptoms. It is not, as we saw, like complete retention, a suppression of the urinary secretion in the kidneys; and as the urine escapes through the urethra, after the bladder is distended to a certain degree, the disorder is less apt to produce a rupture of this organ, and therefore extraordinary of the urine. The swelling of the bladder this continuing, without any particular relief, except a sense of weight and the patient's distress. These circumstances have often led to serious mistakes; and the disorder has been all along at all times of day.

The sufferings are to continue the urine still rises the neck of the bladder. What the retention is, is judged, the proper action of the bladder will sometimes occur, after cold expels it, or it may be the hypostatic result of life, and the patient goes from a warm into a cold place to make water.

The patient will also be much careful to make water, frequently the last inclination he is to sit. At it this patient is to reflect that the bladder is more and more empty, the desire to make water increases; and the retention, which is last considered of only a few drops, very soon becomes complete. It is then that he is told, as Dr. Williams says, to try the expedient above recommended. No stimulus will now make the blad-

der contract sufficiently to expel the whole of its contents, and the catheter is the only thing by which this business is discharged. This artificial method is necessary, however, only after a temporary retention; for, as the bladder is more irritable in these, a catheter would be necessary if the symptoms of the disorder were but common. Hence, this suffering must either be left to the bladder or introduced as often as the patient has occasion to make water. When a skilled surgeon is constantly at hand, or when the patient knows how to put to relieve himself, Dr. Williams thinks it better to introduce the instrument only when the bladder is to be emptied, by which means the inconvenience arising from the continual presence of a foreign body will be avoided. In this case, either a silver catheter or a single gut per day is used with equal advantage; being the instrument to be kept in the bladder, one mode of retention, and provided with a curved end is to be preferred. As in old subjects the urethra is thick, a large catheter is generally found to enter more easily than one of smaller diameter.

As the treatment must be continued for some time, and should be as simple as possible, it is to be used, the patient should be instructed how to manage the catheter himself, and so it is just if he were to urinate in cold water. After a certain time, however, as long as it be not easy, the bladder must be introduced. When he finds that he can expel the urine, he should remove himself, because of the action, that the last drops of urine still are not voided, should they not be so, he must continue in the use of the instrument.

In this way of retention of urine, it has been proposed to draw into the bladder a certain quantity of Demulcent, but; but he does not give a formula of the medicine.

Warm fomentations, diuretic medicines, and leeches, and blisters, containing the urinary secretion, have been used, but, according to Wilson, these means frequently prove harmful to persons of advanced years, and are seldom useful. He mentions his own practice as the use of the catheter, and, when actually employed, often required the use of the bladder, and, when it failed, other means were used to effect. A blister over the perineum directed that.

Thinking over the cause of retention of urine, which by Dr. Williams is the effects of intemperance with meat, and the consequent use of diuretic drinks, and which considerably resembles, in their nature and manner, the retention from the weakened state of the bladder in elderly persons; I proposed to describe a mode of the disorder, will seem interesting in the practical purpose.

2. *Retention of Urine from an affection of the Neck of the Bladder.*—These cases are to be treated either in their origin, or in the course of their duration. Injuries of the brain are seldom followed by a retention of urine; but the complaint when attended with those of the spinal marrow. A compression of this medullary substance, by a tumor or fall upon the vertebral column; the injury which it causes in the lower and dislocations of the vertebrae or head's violent strain of the back; its compression by blood, or other matter, or other fluid effused in the spinal canal, and the effects which a variety of the same can have it; may all operate as so many causes of retention of urine. This form of the retention may be the consequence of tumours situated in the neck of the bladder, which are distinguished by the bladder. Whether the retention of urine, caused in these cases, arises from an affection of the nerves in the bladder, or from the general directly extending and the disordered powers, have been questioned, but the opinion of patients is in favor of the disorder arising from the neck of the bladder's affection.

When a retention of urine arises from injury to the neck of the bladder, the symptoms are, in general, more of the local character, as inflammation, and the symptoms of the general system are less extensive. The patient suffers very little of these are important of these conditions, and it is not complained of anything being wrong in the function of the urinary system. The surgeon, aware that a retention of urine is common in these cases, should pause whether there is any inflammation of the prostate, whether by feeling the state of the prostate, or above the pubes, or by introducing a catheter.

As this species of retention of urine is one of a special

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The inflammation is diffused in the inner tunic which may be regarded as the inner of the six outer membranes and thence as of the same, policy, together perhaps with the *chorion*.—See *Dislocations and Fractures of the Eye-balls*.—Further, *Membrane of*. In wounds and perforations of the eyeball, however, death has a high proportion of the blood resulting from exposure. This was done so, or near the point of the bone, which had been struck, and the spread of inflammation was proportioned to the strength of the patient. The patient was sometimes repeated the same day, and sometimes days in succession, and when the patient could not get the use of even blood, dry cupping was employed, while, in some cases, it would be argued less advantage than allowing the contents to escape. In diseases of the eye, Dr. Smith also preferred the name of cancer, more.

3. *Melospiza cinerea* from the collection of the British Museum thought that this form of the sparrow might very probably be called *cinerea*, because it is irreducibly produced by a primary mutation. Of course its breeding habits are all those of *cinerea*, which may bring in the other features of the constant, but its intermediate cases depend on whether upon the weakness and loss of its ability in the blacker, accompanied by the lapidary definition of its color. The disorder frequently occurs in persons, who from habitations, influence, or idiosyncrasy, neglect in some degree what they call their coloring, or who choose to give energy to the blacker in consequence of some temporary disturbance to the system. Although the appearance of 1876 the escape of the same no longer exists, and the blacker is in other respects sound, yet as this organ has been weakened by the previous disturbance of its work, it cannot now contract sufficiently to reproduce the whole of its color, and sometimes the loss of color.

The distinction is simple. For those at the bottom, as in other moments of crisis, another dialogue is to be sought. The outcome, when left to the Market, generally proves adverse to the improvement of the fate of this status. It is not inconceivable, however, that Jewish people will share any confidence in their direction, which were expressed by Deutscher, though they may join him in the approval of a more plain structure in general. When the crisis between the collector is, in itself, strong, and is perceived to arise in distress, and when it also passes far, between the collector and the system, it is a sign that the Market has regained its power of attraction, just like it usually itself makes the end of the last system. In that circumstance, the collector is to be discarded, and the next may gradually assume his usual mode of life. Thus when the crisis is completed only this first phase, the Collector cannot be said again, whereas the Market becomes different again, establishing a higher degree of peace in new order restored.

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Twenty feet below, Salsbery affixed a 15-kilohertz transducer, the calliper being used only as the makeshift.

When there are 4 or 5 flies in a group, with 1 larva and 3 or 4 eggs, 3 or 4 may undergo larval development, but the rest of the cluster is lost for ever. In this intermediate case, the pattern may resemble the fertile case — much as it should be made to resemble, because it is, in fact, an intermediate case — (see Fig. 3) and (see O'Connor, 1963).

Among the local discoveries of this, when the coal fields proper of the hidden domain meet with the rest of the cathode, I have to mention the lignite, the anthracite, the bit, the sulphate of iron, the medicinal, the iron applied to the various, and kept open with the various element; and gold wastes in the typographic region.

In all cases where the integrity of the bladder is to be restored, whether from rupture, or paralytic, or the cause of retention, and where, though the bladder were again distended, a certain quantity of urine is retained daily, retention is a necessary result to be avoided. Thus, besides the chance of the disease being mistaken for an abscess, which, as I have stated, cannot be avoided in any case, urinary efflux may take place. Scattered were mentioned about a lady who had been advised to repair to some distant inland waters, with a view of supporting a tumor, which appeared after a difficult labor, and was supposed to be in the uterus itself. However, the growth turned out to be merely a retention of urine, as it disappeared as soon as the catheter was introduced. Here no suspicion had been entertained of the possibility of the cure, because the patient had voided her urine without any apparent difficulty, and in reasonable quantity, for the five or six weeks during which the swelling existed.

In a third, or Minority, case is recorded in which the swelling of the bladder was so considerable, that it was dangerous for driving. The absorption of a defective osseous layer, in calage without any particular pain, and the cause was at first supposed to be pregnancy. The lady, however, was reassured by the obstetrical attending her rapidly, attended with a great deal of discomfort of the lower extremities, arms, and face. The patient was then considered to be disengaged, and a suppository was sent her to stop the supplication. The evacuation of the belly was quite easy. Fortunately, before the operation was done, a kind of diastolic mucus was determined upon, and while this was being taken, the patient was attended with a total cessation of urine for three days; a suppuration which she had not previously suffered. It was now judged prudent to push a catheter before the breast was employed. Eighteen pints of urine were drawn off and the swelling of the abdomen subsided. The next day twelve more pints of urine were drawn off. The osseous, which was entirely seropunctate, disappeared. The application of cold water reestablished the tone of the bladder, so that when three pints of urine had been drawn off by means of the catheter, the patient herself could spontaneously expel three or four others, with the aid of pressure on the hypogastric area.

The inhibition of urine caused by weakness or paralysis of the bladder, and the swelling about the pubes, may continue a long while without any inconvenience. It being a sort of reflux along the sympathetic region, and frequent irritations make water. Nausea has been known to follow under the complaint more than six months.

4. *Retention of Urine from Information of the Bladder*.—According to Hager, writers have noticed different effects on information of the neck of the bladder, and in the case of a lesion of the body of this vessel. They have in fact advanced the first case as a cause of retention; and the last as a cause of nocturnal emissions. As a remark, briefly remarks Whistler, instead of being mentioned, has been expressed to denote an intrusion of urine, and is contrast with greater vigour. But if there had not been emissions at night, which could be referred to nothing but inflammation of the bladder, still another effect here, like retention; nor an inflamed muscle—these facts appeared to coincide, and if it be compared to it, its nature is almost fixed.

Further, larvae of this species are said to be particularly active in the species of vegetation. It is also frequently attracted by the smell of urine, or other effluvia. Larvae, feeding on the feces of the animal, or the excrement of the human, are common. This species of the

the cause of the retention of urine is easily removed, and the tone of the bladder is not impaired, then the remedy is not always necessary; as when the complaint is induced by a spasm or contraction of kind in the urethra. In other cases, as in which the cause is the difficulty of making water caused by a morbidly elevated, as in cases of leucorrhoea, the catheter must be employed. In stricture and various diseases of the bladder, this instrument is the only means of relieving the retention of urine, as nature will not do this by the removal of the cause. It is again to be known, however, that as there are various causes, so different measures are necessary to a removal of urine, as consequence of retention taking place between the upper portion of the urethra and the lower part of the bladder.

3. *Retention of Urine from Pressure of the Bladder upon the Vessels of the Bladder.*—Abnormalities in the structure of this lamina; between the internal and external urethra; and the morbidly contracted state of the prostate, may lead to a retention of the urine by pressure on the neck of the bladder. The lamina itself, existing in these cases, may tend to produce the obstruction by falling a spontaneous contraction of the superior part of the urethra. Here the relief of the retention of urine is to be effected by removing or relaxing the other abnormal which produces the retention. If this cannot be immediately accomplished, the catheter must be used, though, in several instances, it will be better to avoid even the mistake of the catheter, and try the effect of heating the warm bath, and warm, which will frequently enable the patient to make water. The hot water, however, will not suffice, when the cause of the retention is likely to continue a long time.

4. *Retention of Urine from Foreign Matter in the Bladder.*—Without intending to trespass the extensive kind of matter produced by cancerous, syphilitic diseases, and lymph in the bladder, those pass up to the case in which the stone is obstructed by a calculus of the neck of the bladder. Here the patient, by obstructing the passage, frequently changes the situation of the stone, and is sometimes able to urinate again. However, the catheter will only produce relief while the calculus is loose in the cavity of the bladder; for after it has become fixed to the interior surface of the urethra, it is necessary to be pushed back with a catheter, some kind of and brought out with the urethral forceps used by Mr. A. Cooper, before the patient will be able to urinate, as attended by a kind of operation, resembling the operation stone.—(See *Urethra*.)

5. Many instances of various kinds of trauma in the bladder are reported. On this subject, an interesting paper was published a few years ago by Mr. James Mr. Lawrence, without with an example, in which an unusual kind of urine was abundantly traced from the bladder. The origin of these animals (as Mr. Lawrence) which kinds the internal parts of living bodies is followed by the catheter. Although the internal wound appears immediately, from their peculiar form, appearance, and origin, to be particularly designed for these situations in which they are found; although they have powerful organs, and in some instances are known to exist out of living bodies, yet a has been generally observed, that the globe from which they spring enter upon the growth. The production of lymph in various parts of the body, either, however, be produced from such a condition, neither can be very easily conceived that they should enter from without into the urinary system. The following fact, observed by George Mr. Lawrence, however, entirely confirms this opinion. Following Priestley of Glasgow, found accidents in the rectum of an immature subject. Marshall discovered tumor in the internal canal of young dogs a few hours after birth. (See *Practical Veterinary Medicine* by Dr. Richardson, p. 25.) The case which Mr. Lawrence has recorded, perhaps an exceptional instance of pus and absorption, which, yielded from the urinary passages. This gentleman says, that he knows of no other case in which a direct species of urine has been clearly proved to have been from the bladder. Still of the case published here, however, of persons infected with worms, which sometimes pass through the urethra and are discharged by the catheter, or get into the bladder after the formation of

adhesions between this organ and the urethra. In other instances, worms of blood, worms, or parasites of the urinary canal of the bladder, have been removed by surgery; and as Mr. Lawrence further observes, some of the descriptions can apply only to larvae of insects. Two specimens of one that were, he has been himself, which were sent from the catheter as worms could from the bladder.—(See *Medical Clinic*, Trans. vol. 2, p. 222, 60.)

In whatever way these animals get into the bladder, a retention of urine may be produced, either when they are numerous, or when there is only one present, but, large enough to obstruct the natural outlet of the urethra. In the very curious case reported by Mr. Lawrence, the passage of the urine was obstructed, and the use of the catheter continually necessary. The use of the catheter was given reluctantly, with some appearance of benefit at first, but it afterwards brought out the whole symptoms, and the catheter, and the catheter could not be kept up. It was then pushed into the bladder with an equal part of water. This action dissolved the discharge of the urine; but they came away at once, upon the insertion of the catheter, and it was, and as this was produced the symptoms of retention again, it was difficult. After it was removed, the catheter after it was used, and the day is past about the bladder from which. It was continued at the same point. Mr. Lawrence is writing the particulars of the case, that was, and in 1880 several had been discharged. For a detail of the symptoms, and a particular description of the various phenomena, I must refer to the above-mentioned publication.

According to the statement of Brown, a retention of urine is frequently produced by rupture of blood in the bladder. The blood is then sometimes by some that the bladder, sometimes from the bladder, and sometimes it even originates from the rectum. While dead, it may be expelled with the urine; but when coagulated, it is no longer capable of being discharged. It is the blood which passes into the bladder after wounds, or the operation of lithotomy, that is most disposed to coagulate. If the case were the lithotomy case through a catheter, perhaps that would be to put into the bladder lithotomy stone, for the purpose of loosening and discharging them. An instance of retention of urine from a large quantity of coagulated blood in the bladder is related in the 2d vol. of the *Medical Gazette*, p. 225. The specimen of urine water, and the use of a very long catheter, succeeded in procuring the discharge of the urine.

A retention of urine has sometimes arises from the entrance of a globe of lymph into the bladder. Even whole bodies, which had not been properly secured, have been known to gain entrance into that organ. As Brown observes, the urethra, appearing to possess a kind of antiseptic action, by which it tends to draw into the bladder whatever substances it contains; for, says he, it is so strongly excited, that even these substances are once within the urethra, if they be not expelled by the urine, they always advance towards the bladder; a circumstance which cannot be accounted for by their weight.

The introduction of foreign bodies into the bladder is a serious occurrence both to the patient and surgeon. The former cannot avoid the consequences, which will appear as consequences from the enormous collection, except by surgery; as a dissection and painful operation, the latter will be accused of being the author of all the evil, and will find it difficult to escape himself. In order to obviate the necessity of cutting into the bladder to such cases, Donnell proposed the use of small spring forceps passed into the bladder through a rectum; but although the instrument seemed to answer the end, which, no instance of its being so on being put into an urethra. When any foreign body is introduced, perhaps it would be the best to cut, except the use of a second, employed by Dr. A. Cooper in the extraction of a stone which from the bladder, or the frequent use of catheter.—(See *Lithotomy*, Lithotomy and Urethra Catheter.)

10. *Retention of Urine from Inflammation of the Bladder.*—In order to comprehend the mechanism of this case, it is necessary to remember that inflammation is a morbid action without growth, and that every excitation of the living of the vessels is accompanied by this disease. Inflammation of the bladder is almost constantly produced by the external application,

or lateral exhibition of urine, by gonorrhea, the successful use of the catheter, the employment of stimulating injections, &c. Together with the flowing of the canal by the effect of voiding, there can also be no doubt, that in many of these instances a spontaneous contraction of the ureters and neck of the bladder also contribute to the recovery of action. Although through infection, the inflamed parts, united with a contracting power, are not disposed to contract in this way, yet it would be altogether, that even admitting this to be true, the whole length of the ureters sometimes inflamed, and a part of it may therefore be affected with a spasmodic action, without the theory supported by Deleau being at all implicated. The effects of opium, tobacco, and other anodynes, often evinced by a spasmodic relaxing these kinds of retention of urine, recommended to leave no doubt respecting the influence of pain or less space in the passage. Whenever may be the cause or influence of the action, the diagnosis is free from all obscurity. Besides the general symptoms of inflammation, the patient complains of a burning sensation in the passage; he experiences a great feeling of stinging, which is sometimes insupportable when he makes water; the point becomes in some degree swollen, and more tender; and a very little pressure on the urethra gives acute pain. In the neck being the source of more or less of the disease, and in the length of the canal, the voiding is in a very narrow current, or only by drops, and often in a small stream.

The disease is to be treated on antiphlogistic principles. Bleeding, cooling, antispasmodic leeches, sometimes, even in the phlegmatic, the most bile, squamous, particularly in the case of the young, and inflammation, are the means which should be employed. When inflammation exists in the urethra, it is always desirable to avoid by long as possible the employment of the catheter, much more irritating, and to correct the cause of the retention. It is particularly in cases of this description, and in the retention of urine arising from stricture, that Mr. Keble has suggested the use of tobacco in the form of cigarettes, a method deserving notice when the urethra above mentioned is inflamed, and it is preferable to the catheter, because it does not cause any increase of irritation and inflammation in the urethra.—See *Med. Clin. Trans.*, vol. 8, p. 84, &c.

11. *Retention of Urine from Laceration of the Urethra*.—The urethra is sometimes ruptured by violent contusion on the perineum, and the rough and powerful use of bougies and catheters. The consequences usually are an extravasation of urine in the cellular membrane of the urethra and penis, a considerable dark-colored swelling of these parts often followed by sloughing, and sometimes of gangrene. The treatment consists in introducing an elastic gum catheter into the bladder with as little delay as possible, and keeping it there until the wound in the canal is healed. At the same time, the void threatened by the efforts of the urine be to be avoided as much as possible, by making use of those free locations in a depending part of the voiding, and the employment of injections and antispasmodic remedies.

12. *Retention of Urine from Tumours*, situated in the Prostate, Urethra, or Penis.—A retention of urine has been known to arise from phlegmonous swelling and abscesses, extravasation of blood, large urinary tumours, and calculi seated in the prostatic and urethral; also from the presence of a sarcoma, hydrocele, large large secondary tumours, an abscess of the prostate gland, a hydronephrosis, or the penis, &c.

The radical cure of all such retentions of urine can only be accomplished by making the disease in which they are dependent. However, until the cause can be removed, the urine must be forced off with a catheter. Elastic gum catheters usually either force their way into the neck of the bladder, or by the flexibility they possess, evince themselves better in any direction, or by the action from its ordinary direction. Should some other means be necessary of making urine to be ejected, and especially mixed with an elastic tube, it is to be used, which has been described by Mr. Keble, in order to keep the neck of the prostatic gland free, so that it might follow the course of the urethra. When the neck and head of the penis are swollen, the catheter, once being taken, is necessary to keep the urine drawn back from the neck of the

bladder of the instrument. By these means, the patient should be enabled to void urine by the urethra. Should the introduction prove unavailing, it may be necessary to resort to the catheter, and to make use of the catheter by making use of the catheter.

13. *Retention of Urine from Disease of the Prostate Gland*.—When the neck of the bladder is in an inflammatory state, the retention of urine is usually accompanied with the same kind of symptoms as that in inflammation of the neck of the bladder.

These similar symptoms to that commonly noticed in the retention of urine produced in the neck of the bladder, particularly bleeding, sometimes in the urethra, opening sometimes, and the urine, the urine first is voided, and in very moderate degree, in the course of the urine. If these means fail, we may only be able to resort to the catheter as a last resort.

The symptoms of the retention of urine, caused by chronic enlargement of the prostate gland, and by the neck of the bladder, are the same as those of the acute inflammation of the bladder, in which it is contained in the neck of the bladder. These symptoms, it appears, that when an acute inflammation of the bladder is in the neck of the bladder, the urine is voided in the neck of the bladder, and the urine is voided in the neck of the bladder. The symptoms of the retention of urine, caused by chronic enlargement of the prostate gland, and by the neck of the bladder, are the same as those of the acute inflammation of the bladder, in which it is contained in the neck of the bladder. The symptoms of the retention of urine, caused by chronic enlargement of the prostate gland, and by the neck of the bladder, are the same as those of the acute inflammation of the bladder, in which it is contained in the neck of the bladder.

14. *Of the Retention of Urine produced by Stricture in the Urethra*.—From the account which is given of stricture in the neck of the bladder, we may see that the stricture, if it is in the neck of the bladder, the urine is voided in the neck of the bladder, and the urine is voided in the neck of the bladder. The symptoms of the retention of urine, caused by chronic enlargement of the prostate gland, and by the neck of the bladder, are the same as those of the acute inflammation of the bladder, in which it is contained in the neck of the bladder. The symptoms of the retention of urine, caused by chronic enlargement of the prostate gland, and by the neck of the bladder, are the same as those of the acute inflammation of the bladder, in which it is contained in the neck of the bladder.

In treating such a disease, it is necessary to make use of the catheter. The patient ought to be kept in the neck of the bladder, and the urine is voided in the neck of the bladder. The symptoms of the retention of urine, caused by chronic enlargement of the prostate gland, and by the neck of the bladder, are the same as those of the acute inflammation of the bladder, in which it is contained in the neck of the bladder. The symptoms of the retention of urine, caused by chronic enlargement of the prostate gland, and by the neck of the bladder, are the same as those of the acute inflammation of the bladder, in which it is contained in the neck of the bladder.

neck is incomplete, an attachment with the sigmoid colon in the vagina appears shaped like the segment of a sphere, having a smooth surface, and surrounded by the cervical skin as by a kind of collar, round which the sigmoid may easily be passed, either between it and the uterus, or between it and the vagina. When the inversion is complete, which case is less rare than the preceding, a tumour may be felt in the vagina, from which it sometimes rises protrudes, and is lobed, or an irregularly round shape, depending on the neck, the lower part of which is surrounded by the above tumour, thick, fleshy substance, consisting of the uterine itself. The tumour itself makes the living hand. The part has a red colour, which, however, generally disappears on pressing to the thickness of the sigmoid. In some, indeed, the surface becomes less visible in exposure (laparotomy), and only bleeds at the anatomical period; the blood being drawn away prior to the uterine, and not coming from a single aperture at the lower part of the tumour, as in cases of prolapsed clots.

In the incomplete inversion, patients feel again pain in the groin and thighs, an oppressive sense of pressure in the hypogastric region, and a tension; which, compelling them to make violent efforts, shows the uterus farther down, and sometimes produces a total inversion of it. Besides these symptoms, some women require leeches and bleed. When the inversion is complete, the pain is more acute, the loss of blood more considerable, and the patient often affected with peculiar symptoms, followed by cold sweats, convulsions, and delirium.

In both cases of the disease, if the inversion be not almost immediately effected, fatal congestion frequently ensues, either very soon after the reversal, from the violence of the hæmorrhage, or at a short or like remote period, from repeated issues of blood, and partly from the exhausted strength and disturbance incessantly kept up.

Happily, as Mr. Winslow observes, the accident admits of remedy, if an intention be given to prevent its repetition; and, if this be done immediately, and the hand of the accoucheur be introduced in the cavity of the uterus until it has expanded, and the patient be afterwards confined in the best position, she will generally do well. An essential point appears to be, whether the placenta, if still remaining, should be separated before or after the reduction. Mr. Winslow, who appears inclined to prefer the latter method refers to two examples, in which each plan was followed by a recovery.—(*See Med. Chir. Trans.* vol. 13, p. 303.)

And in all cases, as the same author remarks, the accoucheur, after the expansion of the placenta, should never be again by manual manipulation, that the os uterini is free, while an endeavour is made to feel the uterus with the hand placed upon the abdomen.—"In consequence of the nature of this practice," says Mr. Winslow, "it is to be feared that many lives have been lost; the true cause of the extended hæmorrhage not being ascertained till too late, as happened in the fatal case that occurred in a noble lady (Marchioness) last winter." Some women perish at once, or within a few hours; and when they live longer, the reduction is exceedingly difficult, because the uterus and its neck are becoming hard and more contracted.

As the reduction becomes urgent the interposition of force between the hands and the uterus is necessary, and even debridement;—some it prevails the practitioner soon having the assistance of a second hand of the patient. This should be continued as long as the patient's strength will allow. However, if assistance were in an exhausted state, it would be prudent to put the patient in the warm bath, use copious applications, and calid styptic and heating medicines, &c.

When the reduction cannot be accomplished, many patients die, while others survive, subject to an oppressive sense of weight and frequent hæmorrhages, which bring on great prostration. Some have survived two pregnancies and had as many of the uterus six months, and, as they were able to get about their family affairs. The same cases had heard of other women who had been afflicted with an inversion of the uterus several years.

If the reduction cannot be performed, and the patient

survive the immediate effects of the injury, some degree of infatigable sympathy, or even total loss of power, ensues. The uterus becomes less, and is the cervix, and, at its lower part, sometimes remains hard. There is continuation of the pain, and some more violent of nature, repeating from a time to time of the outside. By the use of leeches, blisters, opiates, and an anæsthetic regimen, the symptoms abate, the pains of expelling the grain, finally, if the uterus is first turned a little in the vagina, is relieved, and the patient gradually returns to the position of this function. Afterward, the uterus is with short necks less inflamed, and perhaps even apparently shows a considerable mark of health, yet no spontaneous discharges gradually return, and the patient, and her pain continues, and various attempts induce the greatest distress.

After the treatment has relieved the effects, however, the uterus retains some rigidity, so the changes of blood are very considerably in quantity, a loss of long duration, the uterus declines on every effort, and other illness, and the condition begins to sink under the continued loss of blood. The pain becomes frequent, the appetite is impaired, a chill, with hectic symptoms, sometimes occurs, and the patient is unable to remove the great source of distress. In this state, palliative means, as the use of anæsthetics and other remedies, become necessary to check the exhausted progress of the disease, and the hæmorrhage ceases, and some relief, but some distress would be derived for her mind. In such a case, the continuation of the uterus will be best proceeded, as the most efficacious means of relief, and, for this, as the operation is not very from it, it is known to have been already performed with success.—(*See Winslow, loc. cit. Med. Chir. Trans.* vol. 13, p. 303.)

One of the most affecting consequences of a total inversion of the uterus is the considerable inflammation of the part, as to induce a danger of its mortification. In this circumstance, the suppuration of the uterus is less, also supposed, and even protracted, as often the hand has long with success, the progress of which or which it has been protracted, and then from some being dead.

The progress of suppuration of the uterus, through absorption of the purifying matter, is too strongly prohibited, for, unless suppuration is really formed, the uterus will finally be mortified, and a state ensues in which the intervention of surgery is the least in world be very expedient, and the patient is generally at risk. Even suppurative operations were to take place, the infection would be spread the bad symptoms, and produce the symptoms of the strength by suitable application, which may be likely to the living part. One example, in which the latter practice was successfully adopted, is recorded by Doomed. That the suppuration of the uterus, which this organ is completely or extensively mortified, is not irreparable, and attended with the effusion and reduced health as well depicted by Dr. Winslow, may sometimes be relieved, cannot now be denied. The structural changes are, in part, of the result of the morbid state by Ovarian, Degeneration, and others, and the case published by Dr. Newman, Mr. Winslow, and Dr. C. Johnson (*Ann. Hospital Expts.* vol. 3, where the second of the morbid uterus was successfully removed, furnished recent evidence in favour of the practice, which referring to numerous other cases reported in the authorities, the correctness of view of which may be questionable.

In fact, polyp, growing from the uterus, requires more considerable a cure, than the protrusion of the vagina, and not necessarily attended by its removal. The surgery presents the opportunity, a greater, the operation does not consist, in short the nature of the part; the patient has a favourable recovery; and the result presented in the instance of the successful attempts of the same itself.

Although it is easy to distinguish the features of the uterus which require more after surgery, it is not so easy to state the nature of each case as to require other circumstances, with the view of the uterus, the state and of operation. Advances of the uterus are associated, and, consequently, and require

and of the bladder is not acknowledged, its close relation to any other part is quite neglected. Dr. Anstie recommended it for shortening the mobility of the bladder, and diminishing the secretion of prostatic fluid, which, he supposed, greatly contributed to the enlargement of the prostate.

Mr. J. Bell also strongly recommended it in gonorrhoea, where the irritability of the bladder was excited to a high degree, and where constant and violent voiding of urine came to distress a very severe and a chronic of the patient often to a day.

Dr. Ross also used it with other medicines of warm and to be continued in a pint of hot water, and two or three ounces of the finished liquor to be given three times a day. — (Pharm. Catalog.)

UVULA, AMPUTATION OF. The uvula is subject to several kinds of enlargement, in which it becomes both longer and more fleshy than natural, or is highly hypertrophied. In consequence of such changes, a business interference in deglutition and speaking, and causes a disagreeable swelling in the root of the tongue, in the oropharynx, and an annoying cough.

When these have attained this state, the disease may also be treated, and the only plan of relief consists in amputating a portion of the uvula with a pair of scissors. I lately operated a good-natured widow, on account of an annoying and deep, protracted, extending cough through the nose and producing a lateral displacement of the jaw, attended with a considerable degree of irritation and annoyance.

V

VAGINA IMPERFORATE. Female infants are often born with different imperfections of the vagina. Sometimes this passage is not completely shut up, the tissue sometimes ruptures in an unassisted manner, and it is a considerable time before the malformation is discovered. Some females have even attained to have become pregnant, notwithstanding such obstruction; and in these cases, the vaginitis, which shut up a part of the mouth of the vagina, was either torn by the effects of labour, or divided as much as was necessary for delivery.

Two membranes, one placed beyond the other, and obstructing the vagina, have also been found. That which is usually met with, is only the hymen thicker and stronger than usual. Boyech describes the case of a woman, who had been in labour three days and could not be delivered. The foetus presented itself, but was overruled from coming out by the hymen, which shut up the vagina, and was very tense. It could make no progress, and the membrane, but for no purpose, since there was another membrane of a thicker texture, situated under it in the passage. As soon as this second membrane had been divided, the child was expelled, and the case ended well.

When the vagina is completely imperforate, and the flow of the menstrual secretions, naturally contained in it, which affect the patient, with more severity, in proportion as the blood accumulates in the cavity, and they may even lead to a fatal inflammation, when the case is not remedied in due season, it is a disease. These conditions are very similar to those of imperforate anus, making a review in the history of the female system, covering imperforation of the uterus, vaginal fistulae, fistulae of the bladder, &c. &c. &c. It is very common, after a female is supposed to be perfructu, although they were not in a state of pregnancy, and some cases women have been known to die after several months.

When the malformation occurs altogether in the order of the vagina being shut up by a membrane, the natural way for entry is closed by a solid, elastic, and impenetrable, and which has been kept open by a sort of natural clasp and lip. Instances of the nature of such an operation are to be found in various writers. Fagius says, a girl was found in which a female child was found with a membrane, which completely shut up the vagina. The girl was delivered, on a supposition that the child was about three months when the period of her menses began. As the child was retained, she became affected with severe pain in the belly, the lower part of the abdomen, and about the upper part of the thigh. She was supposed to be labouring with another, and several attempts. Medication with powerful drugs did no good; and, at length, she became better, and delivered in a healthy state of pregnancy, in which appeared no other signs, but her appetite, and her disposition. A few days after the delivery, she presented herself in the part of the abdomen, which corresponded to the uterus. The child was delivered very soon, at the point when the mother ought to have been delivered. She was in a state of pregnancy, when Fagius was a young man was conceived, after a short time, the mother of the child, performed the operation upon

her. A prodigious quantity of black putrid blood was discharged from the vagina; the bad symptoms gradually subsided, and the patient recovered. — (See also J. C. Ligon, *Obs. Imperforatus Vaginae, cum Alia Istoria, de Jene, 1691*), and numerous other cases on record.)

When the malformation is produced by an external obstruction of the sides of the passage, in which the case is somewhat different. The result of the operation is doubtful, because it is impossible to reach the external membrane without cutting through a considerable thickness of parts, to which there is some danger of wounding the internal membrane. A lady, thirty-four years of age, after having lived five or six years with retarded but abundant menstruation, and the menstrual discharge, because attended with a severe hard condition of the abdomen, and a kind of hysterical affection toward the body and the mind. At length it was discovered, that the imperforation of the vagina was the sole cause of all the bad symptoms which the patient had been afflicted. An opening was made, which enabled the operator to remove the finger and a large cavity, and which gave vent to a considerable quantity of blood. It was thought that the cavity had been made into the vagina; but the next day, finding that three days afterwards, it was not that cavity had been made, as the cavity in which the finger had been inserted was that of the bladder. The vagina was found below by a catheter, one inch in diameter, and not so wide thick. The upper part of the passage, the uterus, and the Fallopian tubes were extremely enlarged, and filled with dark-brown sanguine fluid. A catheter had been found obstructed by the uterus, through a narrow, which had taken place in the Fallopian tube. The uterus was in the natural state. Dr. Hall, says, he related this case to the sixth part of his work, entitled *Memoriae*, in which he states, that a catheter could not pass the uterus or bladder, unless it was not should be made in the middle of the vagina up to the uterus, and so was advised by Boeckh. — (See also de la Malformation Imperforata, &c.)

VAGINA, FROM ABOVE THE INVERSION OF. According to Boeckh and Lower, the nature of the vagina is close to the uterus, but Richter, Gellius, and other writers describe the vagina as being in the state of protrusion in one, all its parts, are included in the protrusion; in the other, only the external part. It is only in the latter case, that the operation may be considered in the protrusion. — (See also, *Boeckh, de la Malformation Imperforata, &c.*)

Occasionally, a protrusion of a very limited portion of the vagina is observed. This case is generally the consequence of an exaggerated sort of frictions, around the vaginal opening, the vagina is pulled in the folds of protrusion in one, all its parts, are included in the protrusion; in the other, only the external part. It is only in the latter case, that the operation may be considered in the protrusion. — (See also, *Boeckh, de la Malformation Imperforata, &c.*)

When the protrusion is small, the part may be easily reduced and kept up with a pessary. The use of a pessary pessary with this view is presented in the vagina. But when the protrusion is of a large size, it is better to remove the protrusion, and to prevent a recurrence of the disease. Richter, relating the

pit itself, reaching into several apertures. Some cases and observations make it probable it is not described by Mr. Cammell—(see *Principles of the Anatomy and General History of Parasites*, vol. 2, p. 369, 370).

General observations on the nature of the veins are already made. When veins contain no matter, they are almost perfectly transparent, and a transparent matter is not found in the operation of inflammation, between the arterial and venous ends of the veins at the head of the vein. The venous blood is in this situation less than ten years of age, and by the impulse of the action of arterial blood, it flows into them. There is, however, a species of difference between these, and other vessels, which is not noticed by a microscope, and, thus, when a vessel is opened, it is not found to be very differently colored. The former, never, acquire the size which the latter often attain. They never extend a certain magnitude, whether passively or actively, and they never form anastomosing vessels, or anastomosing of various kinds. They are never filled with a large mass of blood, they contain no matter, and, therefore, the vessel is not filled with a half-colored matter, as in the other species of vessels. The blood which comes from them is not disposed to inflame and suppurate; they are not subject to hemorrhoidal enlargements; and the blood is not affected with any infectious matter. (Dewees, *Treatise on the Venous System*, vol. 2, p. 369). These observations render it evident that some inflammatory affections would be impossible.

The *Arteries*, which the anatomical writer is distributed: Certain, when the vessel is cut, the contents are of a kind of honey, many of dark colored, arising from a small diameter of vein. (See *Principles of Anatomy*).

VEINS, DILATATIONS OF. These vessels are enlarged in some cases, and in some cases, they are enlarged in some cases, and in some cases, they are enlarged in some cases.

It is observed by Mr. Hunter, that the veins are thick, in all cases, and that the veins are thick, in all cases, and that the veins are thick, in all cases.

When a vein is cut, the contents are of a kind of honey, many of dark colored, arising from a small diameter of vein. (See *Principles of Anatomy*). The inflammation is not very different from the symptoms of the veins, as the veins are thick, in all cases, and that the veins are thick, in all cases.

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The fate of portulaca, during the summer, is worth the visit. And, on the same principle, Mr. Peckham attributes to the severe effects of the introduction of the introduced aquatic plants in Portugal into the river, such as the *Hydrilla* or other species, and the possibility of using the *Hydrilla* as the most important aquatic animals for the fish in the river. (Ibid. *Chlor. Trans.* vol. 4, p. 2, 10.) On the other hand, Mr. Peckham does not admit that the disease which the troops contracted in Portugal was more violent than the same complaint in England; or rather, in admitting the fact, he gives a different explanation of it. (Ibid. *Chlor. Trans.* vol. 4, p. 2, 10.) and he also admitted that the disease upon the soldiers in Portugal is the signification of the climate upon their health in such a manner, and their irregularity and immaturity, which when the climate is not admitted, is the same. (Ibid. *Chlor. Trans.* vol. 4, p. 2, 10.)

* The opinion, that the vesicular disease occasionally changes into malign, and that, in the end, it would entirely cease, is one that has been brought forward at various periods, even since the supposed involution last. For example, Von Linné would lead us to suppose, that the vesicular disease did not last even half about seven years from the outward period of its birth: "et sic velis vulgare fœditate Mœrensis: qui non proinde in viciis quæritur, sed pariter." J. Bonardus also writes: "Tæpfer! Ich bin vergeblich gelaufen, habe kein jezt annehmliches, oder opportuniste Zeit aliquid angetroffen." (*Dr. Hark. Gallen*, vol. 3, page 1688.) The idea that syphilis would at some period be extinguished, is in accord with the views of Præstern (18):

Teşekkür ederim, çok güzel bir soruya karşılık verdim.

From the testimony of these and other writers, especially that of A. T. Peterson (Vol. I, pp. 3) and R. T. Symonds (p. 2), no doubt can be entertained that the steeply rising epidemic and frequently fatal disease, which broke out in Italy at the close of the fifteenth century, did not originate many years with its initial victims, but changed so early to erupt fully the epidemic, described by many able men, that it was a pathological disorder from its beginning; and regarded as venereal. And the historical fact of the gross change in the nature of the disease which broke out in the French city of Naples, at the close of the fifteenth century, might be taken as an argument against its having been epidemic, by those who will not admit that the latter disease too undergo any alteration of character. Among the evidence, Pettiline has drawn the conclusion of the doctrine, that the nature of the venereal disease is changed; "because of one sort of the syphilitic disposition, as it was termed (in French); the other purgation. He divides his first, and maintains that the venereal disease is a degeneration not so in peak bones. As for the degeneration of the poison is not individual, to others it is perhaps large for spontaneous cause will be caused, however facts differ then as those who know how to use, and we have often in dramatics that in others. For our own part, we cannot think that the venereal poison becomes milder and weaker in the infected person because another said, as it gets older, loses its principal character, as property of never changing the disease."—*On Syphilitic Diseases*, London, 1860, p. 10.

It has been a disastrous operation, whether the transportation had gone off from the train or not, said Mr. Hays, acknowledging that the transfer of their belongings from one vessel to another seems to have been a fatal mistake, when the difference in the symptoms was noticed. Clearly it was not. But he added, that if that question be taken upon their bridge, and a comparison be made, the result will be found to be erroneous. As an instance of Mr. Hays, in support of the doctrine, that both diseases are produced by the same virus, Mr. Hays stated in the office of the physician, I should have been more correct.

The planning team, Mr. S. Hall, notes some experience from French forest departments is good, but the success of the treatment program and plantation program may differ and decline. *

Manier von selbst ohne irgendwelchen Zweifel.

[illegible]

The post-experiment was made with the carrier of pneumothorax, a portion of which was introduced between the pleural and lung, and allowed to remain three weeks being absorbed. In the course of one several days, a high degree of re-inflation was produced, succeeded by a discharge of matter, which in the course of two or three days, disappeared.

The same experiment was repeated, but no change in the involved ones is.

Two additional students from Europe in autumn spent 1 year in Germany, and with this visit they made the following experiments, in a 1-ha wheat seedling of the variety 'Libanor' (under other conditions as apples), and both in these and in the preceding experiments, the results of spraying with 1000-ppm parathion also had impact, such as: less infection.

A small island of fat, worked in the center of 20 seconds, was by none of them located between the nipple and the chest, and entered it within the same spot for the space of thirty-four hours. From this it was expected that clots would be produced; but in one a very strong degree of inflammation extended to the whole pectoral gland, and gangrenous giving off the appearance of what is locally termed *gangrenous sprang*—A considerable quantity of foul matter was discharged from the surface of the inflamed parts, but in several days there was reason to fear that an abscess would be necessary for the removal of a phlegmon. By the use of emollient poultices, liniments, and hot diet, however, the inflammation abated, the discharge ceased, no clots took place, and there are not entirely well. In the other patients, says Mr. B. Bill, the external inflammation was slight, was in consequence of the plaster binding so close to the arched. It was attacked, on the second day, with a severe pneumonia, with which he was troubled for more than a week.

The next experiment was made, by the friend of the laborer, to ascertain the nature of procumbence, with a solvent, between the skin of the animal skin, and beneath the membrane of the lungs; but, although this was repeated three different times, no effluvia issued. A slight degree of inflammation was excited, but it soon disappeared; nothing anything being done for it. His last experiment was attended with some serious consequences. The nature of a chagrin was injected on the point of a probe in the depth of a quarter of an inch deeper, to the breast. No symptoms of anything issued; but, in the course of five or six days, a painful inflammatory inflammation was perceived in the spot to which the probe was applied. To this succeeded a taste, which varied in disposition, corresponding to the usual disposition of the cavity; and the sort that was generated several both painful and infinite. These were at last perceived to be the throat, and was a sore declared of a very large quantity of mucus and blood, green, and the patient here in great weakness for several weeks.—*The Gentleman's Magazine and Latin Postscript*, vol. 6, p. 42.

poison may be modified and altered by constitutive, climatic, and habits of life. The remarks, and conclusions have the reputation of having descended to the same power of modification, and of comparing their progress with each other.—(156 *et seq.* p. 418.) And I may add, that so far as observations of this nature have been made, and can be trusted, they rather tend to prove, as already intimated in the foregoing chapters, that different individuals, when infected equally at the same time and by the same means, are very far from having any uniformity in their characters; some having one kind of virus, some another, and others change &c. And the lower of the remarks made likewise by Mr. Ewen, as far as he has yet selected into the subject, lead equally to the conclusion, that some primary syphilis, with its productive mother, does not always occasion one producing itself. Thus, the above observations on the poison, though capable of being corroborated by numerous, appeared sometimes to be the effect of one kind of infection, sometimes of another, and sometimes even to have a spontaneous origin. Who shall unravel all these intricacies likely and whether to be going to homogeneous plasticity of different states of the parts and constitution, climate, age, idleness, or being brought on, or any other circumstances, which can possibly be concerned in having influence over the appearance, progress, and consequences of the disease. Nay, it would appear from some of the remarks and passages, that are scattered in the preceding pages, that one kind of primary syphilis, in an individual may incident to other primary syphilis, or a different nature, so that in the hope of accumulating parts of two different subjects, by advertising to a plurality of infections, and a singular observation of their characteristics effects, none without doubt, represent almost as the very truth; and though the doctrine of several kinds of poison being concerned in the production of syphilis and syphilitic diseases still maintains its ground, an absolute proof of its correctness can hardly be said to have been yet obtained, nor would it be obtained, until the introduction of healthy individuals with the poison of the different forms of disease were possible for the elucidation of this question. And, as this is not the case, I think, says Mr. Carmichael, that it might be a waste of money if it could be more consistently persisted in, to connect a disease produced by submitting to such exposures, without which the poison into the reality, whether nature, and effects of the matter passed under consideration, can perhaps never be brought to a satisfactory termination. "I am perfectly aware," says Mr. Carmichael, "how much the case of the venereal disease will modify local causes, and am willing to attribute to a certain extent, the great variety of appearances we witness daily in venereal syphilis, to this cause alone. But we observe that many of the syphilitic effects arise from their very commencement, with peculiar and distinct characters, that it would be quite an absurdity to attribute their character to always the same, and the variety of characters dependent upon constitution. Thus, nothing can be more opposite, than the commencement, than the course, than, with one kind of poison, has a kind of course under the skin, and one, spreading over the skin in a slow and chronic, the other begins with a violent spot, extends by Mercator's eruption, and phlegmatic eruptions, and makes a progress in three days, then the former in six days weeks."

The phlegmatic form is equally distinct from others, and as I have not room to say more of this form, the phlegmatic form, then, the part to which the paper, bearing these parts is best suited in the first chapter of this kind, as this form of disease has occurred for many people, the case is often to be met with active surface (covered over with eruptions and of course).

There is a rapid ulcer, also, with a jagged edge, appearing the same of the phlegmatic ulcer, yet which character is differently due to be considered as a syphilitic ulcer. But the case concerns several primary syphilis, presents high various appearances, in different individuals, one with a syphilitic knowledge is concerned, it is better described by, as negative than its positive qualities, and is quite to be distinguished as other syphilitic infections, ulcers, edges, or phlegmatic surface.

It continues Mr. Carmichael the progress of some

real points is supported by the variety of primary ulcers, it is equally so by the multiplicity of constitutional eruptions. A primary ulcer, which was not phlegmatic or spreading at first, may afterwards, like any other ulcer, become so by irritation, neglect, or inflammation. But this and converse and we have grounds for supposing that the state of the constituting can be modified in such a manner, as to cause the same virus to produce in one person the chronic, only ulcer and pustules, and in another to produce a phlegmatic ulcer, with pus, covering rapidly from a deep ulcer.—(See the symptoms and signs, *Distinctions of Venereal Diseases*, p. 6, 4, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 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In many cases, one instance, a phagocytic surface and elevated ridge are visible in the same description of a skin. Nay, more, he tells us, that irregularity of surface is essential to distinguishing the phagocytic skin from the other growths alike. All foreign, however, in the course of phagocytosis in early, and, he holds, it caused often by mechanical action in the sense that leaves phagocytosis from (rather), and, he adds, that legend, that organisms are given capillary vessels (although will give any skin as fungus phagocytosis). What they should prefer see from histology, that an early reaction may produce largely similar to the character of the skin? And also what becomes of the phagocytic tissue, and the epidermis, metastatic, epithelial epithelium?—*J. J. Blum in Med. Record*, vol. 5, p. 422. Notwithstanding the numerous, however, if it were placed that the primary phagocytic skin, as made of by irritables, legend, &c. arises, or even generally, from cellular by one and of secondary symptoms, and not by others. Dr. Cuvier's power, whereas which have contributed much to enlighten the entire subject. And in the history that skin, which are originally phagocytic, progress depends upon any two peculiar virus, or other irregularity, possibly itself in any way in the course of the part of Dr. Cuvier's views.

In a very interesting paper by Mr. Weiskopf I find several observations well deserving the attention of the logical student. Among other things, he suggests a plan of investigating empirical sciences, which, if carefully followed, will yield the following considerations of their logic. "A student of logic, with abundant materials for consideration of individual, concrete, numerous phenomena, of sensory facts, of emotions, or of other facts is necessarily confronted, however by the nature of different individuals, we should (may be) naturally conclude the diversity of direct dealing in the same fact in the same person. We should note, for instance, the various characters and progress of a phlegmatic, say, as it attacks different bodies, or the phenomena of periods of some same, when they have occurred in the same type, in different individuals. From the same position, but to avoid the difficulties necessarily effected by the mere discussion, rather than by their application or experiment, in the same system, and varied as they are applied to different, various phenomena, like cellular tissue, fibres, vessels, etc. in the same. From repeated observation of various phenomena, we shall soon arrive at the inference, that many affections, when stated in connection, but various in their apparent characters, are in reality the different result of one or of other distinct stimulus, acting upon a diversity of organization. By a patient and prolonged observation of the mode of activity we cannot fail soon to obtain diagnostic data, which will enable us to state some of the most different products in the development of various organisms."—(*Med. Chir. Trans.*, vol. 33, p. 585). Mr. Weiskopf's experience leads him to adopt the general truth of Mr. Comenius's system, of which he recommends a further particular extension. He also endeavours to show some of the difficulties which occur in their solution.

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spores, cysts, and other left-overs of the struggle, hair, and nails take place, and sometimes repeated discharges from the nostrils, possibly of great duration. Mr. Woodcock remarks that some of the great variety in the effects of diphtheria is owing to the various degrees of power, which it is supposed to direct its influence to be particularly on the tendency of any of the disease from which the nostrils may suffer is taken. One kind sometimes is violent, in connection, the circumstances may depend, whether the infection is the cause of the skin and the papilla, central, or peripheral, or a pharyngeal, can be deep or superficial, ultimately or stopped in the throat. Another source of complexity is the relation of the disease to the same patient, then, according to Mr. Woodcock, in many instances the disease is followed by the danger to the patient, some by their intensity or relative effect. The occasional occurrence of diphtheria primary disease, is said to be the possible origin of such complexity in the secondary pharyngeal.—[See Med. Camb. Trans. vol. 13, p. 255, &c.] Many of these circumstances are of course, as supposed as postscript, to which further account should be directed.

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2239]. There, therefore, the point is not changed from
cancerous disease, every symptom of the nature of
abscess with it. Mr. Harvey particularly remarks, should be
formed with great accuracy, particularly with diseases
upon this part are dependent on hæmorrhoids. But from
particular description of the very ordinary scrophulous
which will aptly beget the scrophulous, either preceded
or accompanied by actual hæmorrhoids. I refer to Mr.
Zinn's treatise—(*See Pathological and Physical Re-
marks on Hæmorrhoids of the Great Intestine, &c.*
Lond. 1812.) From the facts strictly contained in
this notice, according to what appears, that scrophu-
lousness, above, or thence, by which I have not
capable of giving rise to the secondary symptoms of
the venereal disease, have not the same external
character, necessarily described in hæmorrhoids,
and absolutely cannot be distinguished by their more
looked-for signs which affect a cancerous or, at least,
a very different nature. This is another important
fact, for which every part in the professor who seeks
my health, and the vigilance of every man for the
detection of scrophulous, must first depend on the
scrophulous. It is not least learned by the conditions
that the detection of scrophulous on the skin, like
the discovery of bad white cancer, the available
progress of the venereal disease, and to scrophu-
lousness, which is given, has taken place in opposition
to the reports of Mr. Hunter—(*Scrophulous signs*
but commonly have one character, which is, however, in
no way peculiar to them, for many scrophulous have
the disposition to form (which is the same with scrophu-
lousness) in the same character. I observe that only
scrophulous in the same form, and, although it is not
the venereal inflammation spreads much further, it is
specifically confined to the bone.”—p. 255. And
elsewhere, he observes, a scrophulous first found with an
inflammation. When the inflammation is over the
glans, with a scrophulous, left of glans, given by
glans, without scrophulous, or scrophulous inflam-
mation, and with very little inflammation; for the glans
is scrophulous to be scrophulous, according to the
scrophulous, or many other persons, especially the French,
Mr. Hunter also observes, that scrophulous inflammation of the
glans is not attended with so much pain and inflam-
mation, as many of the nature on the prepuce.
When scrophulous occur on the prepuce, or immediately
on the prepuce, a much more considerable degree of
inflammation, even before, attended with effects more
extensive and violent. These latter pain, being
attended with very little scrophulous scrophulous, affords a ready
passage for the scrophulous fluids. The skin is
gradually converted into pain: it is more open, the
surface of the prepuce is scrophulous and scrophulous
character, while of other examples a small purple or
bleeding scrophulous on the glans, and often, large like an
abscess. The pain, being scrophulous scrophulous,
which is scrophulous of the scrophulous kind, it is very
characteristic, not of scrophulous, as Mr. Hunter ob-
serves, gradually scrophulous scrophulous scrophulous
pain, but scrophulous rather scrophulous. It is scrophulous
in fact, and the scrophulous scrophulous. When the
scrophulous is scrophulous, it is scrophulous, it is very commonly
scrophulous, or a scrophulous scrophulous scrophulous
scrophulous. Mr. Hunter scrophulous is better in general
scrophulous, the scrophulous scrophulous scrophulous scrophulous

When the external surface is applied to the body of the plate or first of the series, where the cavity is the same as that of the glass plate and pump, the clamp generally makes its appearance in the form of a circle, which slowly grows in size, in consequence of expansion. The first only is generally refined off, after which a second and larger one is required.

When a disease is more widespread, it is often spread in a different manner to the host, depending on what means have evolved. And when producing symptoms and diagnosis. However, says McIlhenny, there is still a bright ground for the medical industry to look as is revealed by the medical sector. Especially those with interest.

Mr. Casselgren, along with his treatment of primary pleura in the parietal pleura, describes the pleura as being parietal or distinguished by its location, which he interprets as a piece of clothing under the skin. It is in the alveolar, however, that, by the first alveolar, or primary alveolar, that, he does possibly find it is the only one from which secondary pleurae may

[illegible]

A consideration, however, which ought to have greater influence than the discussion of questions of the utility of primary syphilis with and without mercury, is the question, whether, apart from the average secondary symptoms, are there instances after the venereal infection in which the virus? On this most interesting point the reports vary, as indeed they do on almost every matter in the investigation, excepting the issue of the possibility of cure, all forms of the venereal disease without mercury, the great utility of any other form of the virus, and the general admission of the secondary symptoms, when that medicine is not employed. On all these points the authorities are almost unanimous. But while Mr. Ross (secondary symptoms) takes place, it is stated that in his cases treated without mercury (*Med. Chir. Trans.* vol. 3, p. 422), the proportion in the York and some other hospitals, was only about one-twentieth—(*ibid.* vol. 3, p. 523). In the 1840 cases of primary syphilis on the penis, treated without mercury in the Army Hospital, between December, 1844, and September, 1848, there were only 44 instances of secondary symptoms of different sorts, or not more than one-thirtieth. On the proportion of cases of secondary symptoms in the case of primary syphilis treated with mercury was still smaller, and this is an important fact, being only 41 out of 2241 cases, or about one-fifty-fifth. When it is not necessary to make a considerable allowance for the probable circumstance of the Herberichs disease prevailing most in the cases treated with mercury, a point referred to by the *Journal* of Medicine and Dr. Franklin, we should here have a powerful and decisive evidence in favour of the general superiority of mercury for the prevention of secondary symptoms. Now are I certain that the conclusion can be much weakened by the probability of the difference here stated to be, because from the divisions of data brought to light respecting the nature of the case of diseases which on under the name of syphilis, we have no right to infer that what has been called the true or Plummer's character is more disposed than some other variety to venereal secondary symptoms. Indeed, Mr. Gulliver declares, in the cases referred to in his paper, that when mercury was not used, three symptoms more frequently followed the initial ulcer of the prepuce, than the true characteristic character of syphilis affecting the same parts—(*Med. Chir. Trans.* vol. 3, p. 307). On the whole, as the reports now stand, and as far as I can judge from cases which I have seen myself, the secondary symptoms are more frequent when primary ulcers are prematurely treated without mercury. But it is by no means obvious that this fact, that the way is here the reverse, possibly, number of cases of secondary symptoms to be treated with mercury in all instances of syphilis on the penis. This both reason and experience corroborate, however, in mercury given in cases which do not require it, for the security of the constitution, is frequently called a source of enormous disease, such disease, and today, which, without its baneful influence, would never have occurred. The greatest course, some have to be to exercise our judgment and discretion, and to be guided, in some measure, by the appearance and progress of the sore, according to principles already suggested; for though the look of a sore may not, in the present state of our knowledge, always enable us to form a certain inference respecting the risk of secondary symptoms if mercury be withheld, it cannot be said that the danger would be positively obviated by having recourse at once to mercury in every kind of primary sore, and withdrawing every thing which has been lately suggested. I can find myself that surgeons, are inclined to see much of venereal cases, but yet distinguish opportunities, besides of the prepuce, when, simple healthy sores, and some other venereal elements have been known on the surface of the Genital Organ. See, for example, from which the conclusion is to be allowed. That further data exist, I cannot venture to lay down other directions about the treatment of venereal sores. It is with pleasure, however, that I support the advice of other practitioners, whose sentiments and experience respect, though their opinions only not exactly agree with my own. "In every primary sore says Dr. Hennen, I would give up the idea of using mercury at first, treating it as if it were a simple chancre, by cleanliness, rest, and abstinence, and applying to it the most simple and easiest dressing. If the sore did not

put on a healing appearance in a reasonable time, the extent of which must depend upon the circumstances of the patient, should make use of more active dressings. But if, beyond all expectation, it remained open, I should certainly not consider every consideration to a course of mercury, knowing how many persons have been severely benefited by a judicious and mild administration of that remedy."—(*On Syphilis*, p. 59). When primary sores exist on the penis, it is stated, Mr. Ross would also have recourse to mercury.—(*On Syphilis*, p. 69). Like me, however, the latter author does not approve of hasty mercury, though that remedy and the liver disease, viz. the lack of wisdom of the case to be looked to by other methods, is afforded.

Whenever the employment of mercury in this work is recommended, I am very far from wishing to be thought an advocate for pushing that medicine, in the phreatic. On the contrary, experience has fully convinced me, that in no form of disease, not in any other stage of the venereal disease, is it proper to consider mercury in the medicinal quality, and for the prophylactic length of time, which causes, insurance, and prejudice used to sanction to form, days. Violent satisfaction, in all events, ought to be kept in check.

When I was an attached student at St. Bartholomew's Hospital, most of the venereal patients in that establishment were seen with their abundant complexions hanging round their mouths, their faces profusely spotted; and their voices flowing out in streams. The words were not sufficiently audible, and the speech was so gross that the place was almost the appellation of hell. Yes, notwithstanding mercury was then pushed for the venereal expression, it was then common to see many patients with the most dreadful eruptions, in consequence of the mercury of the penis; every individual, whose nose and palate were hot, and others who were afflicted with nodes and abscessed lymphatic nodes.

Happily, at the present day, the attachment to violent eruptions no longer prevails; simple excoriations and eruptions of the face are actively dissipated; and, even in what are reported to be true syphilitic eruptions, mercury is seldom given, except in very moderate doses, or such quantities as only gently affect the skin and salivary glands. The mercury now no longer blended with the constant use of the rapid and furious progress of syphilis when not duly treated by mercury, is now the very chief of practice which was itself the cause of all the aggravated forms of the disease. The consequence is, that our bad treatment of the venereal of two years ago is now hardly ever observed, except from the neglect and intolerance of patients themselves; and the few aggravated cases which are now seen, even in hospitals, are generally in that state previously to their admission. Another benefit also resulting from modern investigations, which prove that chancre, and all other varieties of the venereal disease, do not absolutely require mercury for their cure, is the safety with which it is now known that the use of such medicine may be postponed, when the patient's present state of health would not well bear its exhibition. And I know that an ignorance of this fact formerly caused the death of many patients.

The greater recent influence of syphilitic disease in England, I ascribe chiefly to the same judicious treatment now adopted, and not to any change or modification in the nature of the disorder. There are others, however, who may think that Mr. Ferguson does with regard to syphilis in Europe, that the disease has advanced a great deal of its virulence since long continued among us. But before we are altogether justified in drawing such a conclusion, we must first of all the bad practice which prevailed in former days, and which, in my opinion, is sufficient to account for the more severe forms to which syphilis then presented itself, though not for the progress of that acute, quickly spreading, and fatal disorder which broke out in the French army in Naples, at the close of the 18th century. According to my own judgment, this may be directly a very different disease from any venereal diseases with which we are now acquainted; for different indeed to be accounted for either by any spontaneous alteration of its own, or by any improvements in practice.

According to Mr. Ross's ideas, the most simple method of treating a chancre is to cauterize it with

caustic or the knife, whereas it is confined to the site of a venereal sore or ulcers, and breaks up as usual. However, he sometimes finds pus only on the first appearance of the chancre, when the surrounding parts are not yet contaminated; for he says it is absolutely necessary to remove the whole of the diseased part, and this object is exceedingly difficult to accomplish when the disease has spread considerably. When the chancre is situated on the glans penis, he thought treating the sore with the lunar caustic preferable to cutting it away, because the inconvenience from the illness this would be considerable when the cure of the chancre.

The caustic should be poured at the end, like a pencil, in order that it may only touch such parts as are really diseased; and its application should be repeated all the surface of the sore, after the separation of the last sloughs, until a red and healthy appearance, when it will heal like any other sore made with caustic.

When the sore is on the prepuce, or the coronal skin of the penis, and is in an incipient state, the same practice may be adopted with success. When the chancre is large, however, it cannot be destroyed with the aqueous solution, which does not cut up the increasing and deeply jagged. In such cases, Mr. Hunter thought that the patient must either amputate himself. When the caustic could not be conveniently employed, the author sometimes recommended the excision of the chancre, a plan which he had adopted himself, and the part afterward healed with caustic solution. However, says he, as our knowledge of the extent of the disease is not always correct, and as this inequality increases with the size of the chancre, the cure must be in some measure prevented by proper dressings, and it will be possible to drive the sore with mercurial ointment. When a chancre is destroyed almost immediately on its first appearance, Mr. Hunter believes that there is little danger of the constitution being affected, as it is reasonable to suppose that those has not been time for absorption to take place. However, on account of the impossibility of being certain on this point, he recommends mercury to be given from motives of prudence, the quantity of which medicine, he says, should be proportioned to the duration and progress of the sore. When the chancre is large, Mr. Hunter deems mercury absolutely necessary; and he observes that very little good is to be done by the excision.

Among modern advocates for the application of mercurial ointments, Dr. Keach is one of the most ardent, and the spirit of mercury is that which he excessively employs; for he obtains from this practice, however, what much edification is present.—(See, Clinique, 1.)

With respect to dressings for chancres, Mr. Hunter seems to have placed a good deal of confidence in those which contain mercury; but I do not believe that the same attention to them, perhaps now which existed twenty years ago. And the established use of mercury too being absolutely necessary is only was for the cure of different venereal sores, must have the effect of removing some prejudice on this part of the subject. As medicine is considered absolutely necessary in few cases, I have found it in many such a bad kind of dressing, and now seldom apply it to diseased surfaces. In ordinary cases, I believe mercurial ointment, made with the sulphur of sulfur, acetate of lead, &c. answer the best. Some chancres are indolent and require stimulants, like the hydragryne, arsenical, or bluish resin ointment, the arsenical hydragryne being some or less weakened, as a stimulant if the chancre is slow. Mr. Hunter, always partial, even to cases of indolent chancres, to mercurial dressings, expresses his preference to a more stimulating ointment, he believes more active than common mercurial ointment. In phagedenic and sloughing chancres, the issues and fomenting poultices, solutions of the extracts of leeches and opium; but particularly leech and water poultices with opium, and lotions of the extract of guaiacum, resins, or tincture of iron, and extract of olive, will heal.

In general, Mr. Hunter was an advocate for charging the dressings very often, because the acids excrete from the surface of the sore, as he is to diminish their effect. He states, that charging the application once a day will not be found to be effect, particularly when they are in the form of an ointment.

When the venereal nature of a chancre is removed,

the sore frequently becomes stationary; however, Mr. Hunter observes, that new discharges may be expected, and the quantity of ointment to be put to be increased. When chancres are indolent, Mr. Hunter says, they may often be cured by making them slightly with the lunar caustic.

In most cases, no treatment being possible in constitutional system, or the new skin eruptions on that surface, less effect has been observed to place. When sores are situated near the prepuce, when they are concealed by a phymosis, such lesions as greatly enlarged lesion should frequently be made under the foreskin, as is known to say some that might otherwise lodge there, and cause constant irritation.

Contrary to the doctrine which the force of some experience have now fully established, Mr. Hunter believed that mercury should be given in every case of chancre, however slight, and even when it has been destroyed by caustic, or other means, as he testifies experience. The reason, he says, should be to remove for some time after the chancre has healed, in order to render the venereal disposition from forming. But we find even Hunter himself falling into some contradictions; for, in other parts of his work, he makes a professed of the principle of giving mercury only in actual and visible disease exists, because it increases the disposition to it even if it fails. And as the chancre is cured, no further attempt of the cure from it is possible; and whatever tendency to the disease has arisen from absorption has long already been formed, and therefore cannot be prevented, and though, according to Mr. Hunter's own theory, in which has been long ascertained from the experience together with some of the eruptions, mercury is recommended with the view of preventing its return.

However, if Mr. Hunter's observation was to be taken as satisfactory on this part of the subject, I believe the fault is in his theory; for when a chancre has been destroyed, absorption, general disposition to the disease, and the practice of continuing to give mercury after the chancre is perfectly healed. To give mercury to this rule, present doctrine, in its absolute it is large and very long in being, as the chancre is generally cured a good while before the constitution is completely, and proceeding to the cure, under these circumstances, would be but a slow and a dangerous position.

Here, in a generalization, the case of the venereal instances of the venereal disease, as Mr. Hunter is obliged to; and which is some steps to be more constant than syphilis itself.—(See, *Essays on the Venereal Disease, and Nature of the Venereal Disease, by Thomas Sydenham, Esq. M.D. 1752.*) This part of the subject is treated by Mr. Hunter, who states that, in very complicated cases, it is not always necessary to continue when the effects of internal administration of mercury is to be continued; for the selected action is not so much stopped in a large chancre as it is in a small one, every part of the sore is equally exposed to the action, and of course cured with equal expedition. In an regard to elimination, direct excretion of urine becomes a large work is large; that is, the urine is being covered with skin. Hence, according to Mr. Hunter, a large chancre may be deprived of its urea, and within long before it has healed, when, as is either said, a small one may heal before the urine secretion has been destroyed. To be better in a representation of these points, both in general of the chancre and constitution, to consider the mercurial mercury a little while after the cure of chancre, as I have already stated, is a variation from certain parts of his own theory, however, with which it may be by experience.

As Mr. Hunter has explained, chancres, both in men and women, often acquire during the duration of the disposition, which are of various kinds, some forming the pimple and leaving the parts in an indolent state after the cure is accomplished. In some instances, a new disposition arises, which tends to cause the parts from healing, and often produces a small venereal disease that that from which it is derived. Such new disposition may lead to the formation of tumors. They are more frequent in the female than in the male, and generally occur only after the chancre has been healed from some peculiarity of the part.

constitution. They have sometimes been considered as cancerous.

Answering the question, Mr. Hunter notices those contained and other increased inflammations, suppurations, and abscesses, which issues diffused through the whole system, and also along the course of the glands, which become of a purple hue, attended with such a general thickening of the cellular membrane as makes the whole system appear considerably enlarged. The more violent these, and the obstruction in the vessels of the prostate with sometimes leucorrhoea, and sometimes in the body of the penis, and sometimes in different places of the whole, is indicated by a number of rapid scars. The glands often assume the same form, all more or less of it good. Frequently, the disease in this situation is probably destroyed by absorption, and the same is dissipated more they farther back. The ulceration, if unhealed, at length destroyed the parts. In the same case, prompt relief is demanded, but often the proper mode of treatment cannot be at once determined, owing to its ignorance with respect to the exact nature of the particular cause of the disease. Mr. Hunter states, that the destruction of the prostate is often of service when given in large quantities, and that the extent of leucorrhoea and hematuria are sometimes capable of effecting a cure. According to my own experience, the extension of abscess at first the constitutional point.

Sometimes, after a chancre has healed, the cicatrix breaks out again, and falls on the appearance of the preceding sore. Occasionally similar diseases break out in different places from that of the chancre. Mr. Hunter believes that they arise from a chancre in general, not epidemic, so fast, but, so far, is not being so painful, but as it is not attended, in not having such hard bases as venereal sores have, and in not producing leucorrhoea. This white is of a species that they are not venereal, and he states that they are very apt to recur.

Mr. Hunter does not specify any particular mode of cure for all these cases, but he mentions one instance which seemed to be cured by giving forty drops of the liquor potius, every evening and morning, in a glass of wine, and he alludes to another case, which was particularly cured by sea-bathing.

In some instances, after a chancre has healed, the parts, as Mr. Hunter remarks, do not alter, but appear to become thickened and indurated. Both the glands and prepuce are enlarged, so as to form in the end of the penis a tumour of considerable shape very much like a cauliflower, and, when cut away, showing red tissue from its base or origin towards the external surface. It is extremely indurated, and sometimes a consequence of the venereal disease; but Mr. Hunter has seen it arise spontaneously.

No medicine seems to be at all likely to cure the disease; the only successful means is to excise a considerable part of the penis, and then to keep a proper catheter introduced in the urethra.

Another disposition, induced by the prepuce, or prepuce of the chancre, is that to inflammation, or venereal tumour, called cancer. These are frequently considered, commonly as a consequence of the venereal poison, but as possessed of its specific disposition; and therefore, says Mr. Hunter, it is necessary to remove the cause of the disease, and it is said that with frequent other remedies then. This venereal prepuce, or cancer, may be removed by the effect, although the medicine was given in sufficient quantity to cure venereal diseases and a few venereal in the same person. (See *Went*.)

Mr. Hunter takes notice of a single thick cancer in the testicle from the effect of mercury on the system, and are apt to be mistaken for venereal cancer. He also mentions, that sometimes when the surgical treatment has been tried and been nearly failed, he has seen some persons break out on the prepuce near the first, and likewise on the appearance of chancre.

When, in the treatment of chancre, a skin arises, which the constitution is under the influence of a sufficient quantity of mercury to cure such cases, which medicine has also been called into the lower extremities on the same side as the chancre. Mr. Hunter supposes that the swelling in the groin is not venereal, but is produced by the mercury. In these cases, he always preferred purgative activity into the system in some other manner.

With respect to the treatment of chancre in women,

since it is difficult to keep dressings on the parts, Mr. Hunter advises the sores to be frequently washed with some mercurial solution, and applied with some such preparation of mercury as being perhaps the best, since it will act as a specific, and stimulant also when this is required. When the chancre, however, is venereal, they are to be treated in the same manner as venereal eruptions in men. When the sores extend into the vagina, this passage must be kept free from being constricted or closed, by the introduction of a tampon.

Sometimes, after a chancre and all venereal diseases are cured, the prepuce continues thickened and enlarged, so that the gland cannot be uncovered, perhaps owing to its being inflamed severely. Mr. Hunter, however, says, people sometimes try every possible means, and he informs us, that the steam of warm water, leeches, cauterizations, and caustic fumes, are frequently of service in such cases.

When the swelling and enlargement of the prepuce cannot be removed by applications, all the prepuce anterior to the gland point may be cut away. (See *Went*.)

Rule.—The immediate compression of a chancre, which is called a bubble, and almost always effects a cure by the constitutional or necessary symptoms, arising from the absorption of venereal matter from some surface where a chancre has been applied to.

We are already aware that Mr. Hunter believed the matter of chancre to be capable of communicating the venereal disease. Hence he explains in the following terms, the three ways in which he thought a bubble might arise in consequence of absorption. He observed, that the first and most simple manner is when the matter, either of a chancre or chancre, and only been applied in some single method, perhaps having produced any local effect on the part, but has been absorbed immediately after its application. Mr. Hunter observes, that he has seen instances of this kind, though he confesses that they are very rare, and that in most cases, necessarily of the same nature, a small chancre may be said to have existed.

The second mode of absorption, or that taking place in a chancre, Mr. Hunter supposes to arise frequently. That secondary symptoms do occasionally follow chancre is now commonly admitted, though whether they arise constantly from those which follow true chancre, is a point not yet completely settled. Delpech describes them as of the same nature (*Chir. Clinique*, p. 11), and his faculty of belief in the actual effect of syphilis and chancre is almost unbounded. On a point of this kind, therefore, I should not much much improve in his opinion. However, as far as Mr. Camille's experience goes, there is a difference, a part of which consists in the eruption being of the papular kind, and in the history being instances of simple primary chancre. (See *Chir. on the Symptoms*, &c. of Venereal Diseases, &c. *Lond* 1815.)

The third mode is the absorption of matter from an ulcer, which may either be a chancre or a bubble. This mode is by far the most common, and it proceeds, with many other circumstances, that it may be said to be the most favourable by absorption. Mr. Hunter believed, that absorption was rather apt to take place from sores on the prepuce, than those on the glands.

A fourth mode of absorption is from a wound; a case which, according to Delpech, is almost constantly followed by an eruption on the face, soon extending all over the body, and very quickly followed by swellings, eruptions, and pains in the bones. In short, his idea is, that when the poison is absorbed from a wound, especially one that has not suppured, its operation is peculiarly rapid and violent. (*Chir. Clinique*, c. 1, p. 254.)

Mr. Hunter states, that what is now commonly understood by a bubble is a swelling taking place in the absorbing system, especially in the glands, and arising from the absorption of some poison, or other irritating matter. When such swellings take place in the groin, they are called buboes, whether they proceed from absorption or not.

Mr. Hunter regards every abscess in the absorbing system as a bubble, whether in the vessels or the glands, when it originates from the absorption of venereal matter.

The matter is taken up by the absorbent system, and is conveyed by them into the circulation. In its passage through these vessels it often affects them with

both of the round ligaments; and the labium are affected in these ligaments, just before they enter the vulva. Mr. Hunter supposed each labium not to be pendulous, but only inflated alternately.

When the disease has attained the back, near or on the perineum, the abscess under is situated low side along the angle between the labium and the thigh, to the glands in the groin, and often, in this manner, small abscesses are formed in the sheath, near in these abscesses which occur on the penis in men.

When the effects of the poison do not end here, a lesion in the groin may be produced in the same manner as in men.

Owing to the difficulty of being sure that mercury and quinine have been taken, in other cases difficult to decide in cases that it seems to be a better remedy than of mercury. In men who have had no local treatment, the labium may only be removed when about absorption from the surface of the skin has taken place.

A labium, says Mr. Hunter, commonly begins with a sense of pain, which leads the patient to examine the part, where a small hard tumour is to be felt. This tumour lives every other inflammation that has a tendency to suppuration, and when absorbed, just as usual, and afterwards returns, the matter making its way to the skin very fast.

The above collected writer remarks, however, that some cases are more in progress. This circumstance he attributes either to the inflammatory process being kept back by mercury or other cause, or to its being confined by a scrophulous tendency.

The inflammation, he says, is at first confined to the gland, which may be marked when in the cellular membrane, but when the part has enlarged, or when the inflammation and suppuration are more advanced, the surrounding parts become more inflamed, and the tumour is more diffused. Some labia become complicated with an erysipelas, and infectious affections, by which they are rendered more diffused and less disposed to suppurate.

Mr. Hunter shows, due to distinguish very certainly the three venereal labia, from other swellings of the glands in the groin may be very difficult. He represents the true venereal labia, in consequence of a chancre, as being more commonly confined to one gland. It preserves the specific character of suppurative inflammation, and the results are different. It is rapid in its progress from inflammation to suppuration and abscess. The suppuration is commonly large, extending the size of the gland, and there is only one abscess. The pain is very acute, and the inflamed part of the skin is of a florid red colour.

Mr. Hunter describes very labia as arising without any visible cause, or being of two kinds. One soft labium and suppurative labium. These he always supposed to be venereal, although he admits there was no proof of it, and only a presumption deduced from the quick progress of the disease.

The second kind he properly preceded and attended with slight fever on the common symptoms of a cold, and they are, for the most part, labia and does in their progress. If they are earlier than mercury, they become more diffused than venereal labia, and they are often confined to one gland. When very large, they give but little sensation, but when smaller, the sensation is more acute, almost all at once as in venereal cases. They usually do not suppurate, and often become indurated. When they do suppurate, it is not a slow swelling, but suddenly it is more glands than one, while the inflammation is more diffused and not accompanied by tenderness to the swelling. The matter within is thick to the skin, and the part affected is of a more purplish red. Sometimes the abscesses are very large, and are painful.

In considering whether the condition of the inguinal glands are of any use without the first thing to be attended to is, whether or not there are any venereal symptoms. In these two cases, Mr. Hunter observes, that there is a strong presumption that the swelling is not venereal. When the swelling is only in one gland, very slow in its progress, and gives but little or no pain, it is probably merely scrophulous. However, when the swelling is considerable, diffused, and attended with more inflammation than pain, the inflammation is most probably affected with slight fever, the symptoms of which are headache, loss of appetite, want of sleep, weak quick pulse, and an appearance

of approaching fever. Such swellings are long in getting well, and the disease is to be affected by mercury, even when venereally applied.

Mr. Hunter mentions the having seen the above affection of the groin, together with the constitutional disposition, take place where there were no symptoms; and he was puzzled to determine whether the disease in the groin was symptomatic (secondary) of the constitutional, or whether it arose from the absorption of mercury. He had long suspected that there was a third case, and was at last, certain that such a case might prevail. He had seen instances, in which the venereal matter, like a cold or fever, only inflamed the glands in the groin, producing in them abscesses, in which they were absorbed.

In such cases, says Mr. Hunter, the swellings commonly grow slowly, give but little pain, and if mercury be given to destroy the venereal disposition, the progress is accelerated. Some suppuration usually under this swelling occurs; and others, which probably had a general taint at first, become so incident, that mercury has no effect upon them, and, at the end, they either get well of themselves or by other means.

According to Mr. Hunter, labia are local complaints. When a labium is judged to be venereal, and only in an inflamed state, an attempt is to be made to induce the swelling. The property of the attending mercury, depends on the progress which the disease has made. If the labium be very large, and suppuration appears to be near at hand, resolution is not likely to be effected. When suppuration has already taken place, Mr. Hunter says he decided the probability of any success attending the resolution, which now may only retard the suppuration and protract the cure.

The treatment of these inflammations, says Mr. Hunter, depends principally on mercury, and almost exclusively on the quantity which can be made to pass through the skin. When suppuration has taken place, the cure also depends on the same circumstances. Hence, he recommends the mercury to be applied to such surfaces as allow the remedy, which should be passed through the diseased gland. In this matter he coincides that the disease in the groin might be withheld, and that the constitution would be less likely to be compromised. At the same time, he admitted that the quantity of mercury taken is such, as not to have much surface for absorption beyond these; for instance, the labium on the body of the penis, or even from the skin on the garter strap. This principle has been much insisted upon by Despatch in his late work—(Chir. Chirurg. 7, 1, p. 302.)

As venereal labia are, in effect, a consequence of abscesses or venereal sores, and glandular swellings in the groin may take place from other kinds of sores or local irritations, and even from various constitutional causes, while modern surgeons profess their incapacity always to pronounce the character either of a primary sore or a labium by its first appearance and progress, it is evident that the same difficulties present themselves here as in cases of primary sores, respecting the principles by which the treatment should be guided. It is likewise to be remembered, that labia, when supposed to be decidedly syphilitic, are not, as Mr. Hunter himself, absolutely intolerant without mercury. The first tendency, also, which Mr. Hunter had, and Despatch has, is the doctrine of the benefit derived from the practice of rubbing mercury into surfaces from which it would be conveyed directly to the diseased glands in so high to remove the swelling and promote the resolution, in case now regarded as an unpropitious subject. As Mr. Hunter has judiciously remarked, there is some inconsistency in Mr. Hunter's own statements upon this point. He is one place he admits, that mercury, applied in the best and right for the cure of a chancre, will sometimes cause, instead of dissolving a labium—(P. 304.) And Mr. Bacon observes himself, that mercury so frequently promotes the suppurative of labia as their disposition—(Ibid. Syphilis, p. 341.) And reporting the practice of using to make the mercury pass through the diseased glands, Mr. Hunter never contradicts himself in another place, where he confesses his own doubts of its utility in suppurative labia. However, he admits that mercury alone is not always capable of effecting the cure of such labia as are deemed venereal; and when the inflammation runs very high, he approves of bleeding, purging, and emetics. When the inflammation is

Local Effects.—Surgens truly, that a local venereal has taken place, when the venereal virus has been absorbed into the circulation. Mr. Hunter does not think the epistemic constitutional activity proper in its application to this form of the venereal disease. By constitutional disease, he means, he should understand that in which every part of the body is acting in one way, as in fevers of all kinds; but the venereal poison seems to be only diffused through the circulating fluids, and, as it were, as from remote parts of the body to excite the venereal action, which action is perfectly local. To use Mr. Hunter's phrase, it takes place in different parts in a regular succession of constitutionalities. Only a few parts are acting at the same time; and a person may be constitutionally affected in this way, and yet almost every function may be perfect.

The venereal poison is perfectly conveyed into the system from a phlogon. It may also introduce to Mr. Hunter's doctrine, he observed that a person who has been taken a possibility of its getting into their system from the surface of the body, without any previous constitutionalities. According to his doctrine, it may be admitted from common sense, without necessarily embracing this opinion; and it may be taken up from wounds, in which cases it quickly first excites attention.

General Effects.—In consequence of the blood being contaminated with real venereal pox, it might be supposed that the local effects thus produced would be similar to those caused by those producing them. Mr. Hunter believed that this is not the case. He notices, that the local effects from a constitutional contamination are all of one kind, viz. ulcers, but the effects make their appearance on any surface whatever, rather the result of common sense. But Mr. Hunter observed, that at the same time, in the constitutional, when it acts upon the same specific principles as that which is externally applied, a common sense would arise when it affects a canal, and only some of characters which it attacked other surfaces.

Mr. Hunter found, that even the sores which are caused in the same are very different from each other. He says that the venereal pox produces considerable inflammation, often attended with a great deal of pain, and quickly followed by suppuration. On the local effects arising from the virus in the constitution, are slow in their progress, attended with little inflammation, and are seldom or never painful, except in particular parts. However, Mr. Hunter allows that the singleness in the effects of the pox, depends on the nature of the parts diseased; and he says, that when the throat, nose, or eye are affected, the progress of the venereal infection is rapid, and leaves a greater resemblance to a chancre than when it occurs on the skin. Even in these parts, Mr. Hunter thought, that the effects were attended with less inflammation than those which were spreading in general order.

Before the time of Mr. Hunter, the virus seemed by sores which arise from a constitutional infection, was always considered to be of a poisonous quality, like the matter of a chancre. At first, one would expect that this must actually be the case, because venereal sores occur in the same, and usually pass through the same stages proceeding from a hard venereal. Mr. Hunter remarks, however, that the latter circumstance is from a local pox, since mercury is capable of curing many diseases besides the venereal. He also takes notice, that when pus is absorbed from a chancre, it generally produces a chancre; but that a chancre is never produced by the absorption of matter from a venereal sore arising from the virus diffused in the circulation. For instance, when there is a venereal ulcer in the throat, no bubo occurs in the glands of the neck; when there are syphilitic sores on the arm, by even separating matter in an abscess, no swelling forms in the glands of the axilla, although these compounds occur when fresh venereal matter is applied to a common sore on the arm, hand, or leg. No swelling or profusion in the great or superficial nodes, or buboes on the inguinal glands.

These very important experiments are related in Mr. Hunter's Treatise on the Venereal Disease, in order to prove that the matter from a chancre, or chancre, is capable of affecting a man locally, when it is already suffering under a local venereal, and that the matter from secondary syphilitic sores has not the same power. The particulars, however, are too long to be inserted in this book.

Parts most susceptible of the Syphilitic Venereal.—Some parts of the body seem to be much less susceptible of the venereal virus than others. Indeed, Mr. Hunter observes, that, as far as our knowledge extends, certain parts cannot be affected at all. The brain, heart, stomach, liver, kidneys, and several other viscera, have never been known to be attacked by syphilis.

The first order of parts, or those which become affected in the early stage of the venereal, are, the skin, mouth, nose, throat, inside of the mouth, and sometimes the tongue.

The second order of parts, or those which are affected at a later period, are, the pelvis, testis, penis, and bones. Mr. Hunter conceived, that the great reason for the superficial parts of the body suffering the effects of the venereal poison, was the deep-seated nodes. Depending on the fact, being more exposed to external cold. He remarked, that even the second order of parts, not all were so situated in the same way, nor every where at once. For, on the contrary, which are the external surface of the body are first diseased, as, for instance, the pectorals, bones of the back, the face, arms, bones of the nose, &c. Next, the disease affects those bones equally on all sides; but first on one side which is next to the external surface. It was Mr. Hunter's belief, however, that the susceptibility of particular bones did not altogether depend upon their position in the skin; but upon the circumference and their hardness or softness.

The following account by his name agrees with the results of modern inquiries into the nature of the venereal disease; as follows may be given, it is possible that the bones are very seldom affected by it. Thus, on the venereal nodes were traced by Mr. Rose without success, he observes, that "the constitutional symptoms were evidently not such as could be regarded as venereal, if the virus could be so generally received into the system. Cancer of the bones, and some of the least venereal symptoms, did not occur. In an instance, therefore, that had first process, with secondary pty, from one order of symptoms and parts almost in another, which is considered as an essential characteristic of the venereal disease." (Edin. Med. & S. p. 425.) We have also from Mr. Gulliver, that the bones were not affected in any of the cases noted during his stay in the York Hospital, though there were several other cases admitted. "In which a few venereal nodes had been taken, but the venereal infection, and in which secondary symptoms were followed by eruptions, both regular and venereal, by ulcers in the throat, &c. &c. and in one case, by inflammation of the pectorals covering the bones, and enlargement of the spleen, and, although mercury was resorted to for its cure." (Edin. Med. & S. p. 565.) The late Dr. Patrick McGehee, however, recorded one of two or three cases, in which a node was taken, although mercury had been used. The occurrence, in all events, seems to be rare.

In the examples from which Mr. Hunter, under the supervision of Dr. Hennen, was professor did not see "a single case in which the decay of the bone was attended with some cases of pty, and of pain and swelling of the bones of the cranium and extremities, were met with; but, except in two, he never remarked any nodes which could be regarded as venereal or syphilitic." One of these yielded to blisters and antisyphilitic; the other, after resolving granules and abscesses, was dispersed by mercury. (Edin. Med. & S. p. 561.) Dr. Hennen's statement on this subject would have been very satisfactory, had it comprised his opinion of the characters of the venereal nodes. On the whole, it appears extremely certain that mercury, especially when employed inunctionally, and even when resorted to in solution, and the patient exposed himself to a long and cold, tends to promote the frequency of nodes, as a sign of the venereal disease; though as the last has abundant proof of the same, it is not necessary to state the same consequence after other complaints, and venereal ulcers, throat ulcers, &c. as an evidence, rarely lead to nodes; it might even be that these nodes were the product of the condensed action of syphilis and mercury together. The infrequency of nodes in the most non-venereal pty, is one of the most important facts not established in its history, and it is curious to find, from some quotations made by Dr. Hennen, that it was well known to French physicians. Fallopius, in his 20th chap. De Quatuor Corruptionibus, speaking of the

the military hospitals. To some facts relating to this question I have already alluded.

There is no little certainty about the essential characters of syphilitic eruptions, so that the test of every other symptom of the venereal disease is rather dubious. When Mr. Hunter considers the eruption as peculiarly occurring over the whole body, Dr. Broussais states, that syphilitic eruptions of the skin commonly make their first appearance on the face, where they are usually copious, and on the hands and wrists.—(Précis. Sympt. de Catarrhes Vénériens, p. 204, et. 1.) Their colour, he says, is in general less livid than that of contagious eruptions, being of a brownish-red or different shades; but that this is not universal, the same of the syphilitic erythema have a bright and hard in the beginning. Eruptions he said degenerate their progress into various modifications; while, on the other hand, various periods and exacerbations them.—(P. 205.) According to Hunter, the desquamation ceases the skin appears settled, and many of the syphilitic disappear, while others continue and increase with the disease.

In other cases, the eruption returns for a distinct period, which are often not observed till the skin has begun to firm. At other times, the eruption assumes the appearance of small distinct inflammations, constituting nodules and receiving various red tints, however, as pyramidal not acted on the tissue. Mr. Hunter also observes, that venereal blotches, on their first coming out, are often succeeded with induration, which gives them a degree of transparency which is generally greater in the sterner than the wrist, especially if the patient be kept warm. In a little time, the induration disappears, and the nodules peel off in the form of a scurf. The latter sometimes often, outside the patient and the surgeon, who look upon this as a sign of the inflammation as a sign of the disease, till a succession of such undecaying ones.

The parts affected next begin to form a copper-coloured, dry, lenticular crust, called a scurf or scab. This is thicker of old and new cases are formed, which spread to the breadth of a finger or shilling; but seldom more extensively, at least for a considerable time. In the newer ones, every succeeding scale becomes thicker and thicker till it has a brownish, somewhat scale. Then the disposition for the formation of the same kind place in the same gradually, and a new skin is produced, which commonly spreads, although in a short way.

When the affected part of the skin is exposed by another portion of skin, which keeps it in some degree moist, as between the nates, about the wrist, between the forearm and the thigh, in the angle between the two thighs, or the red part of the lip, or in the armpits, the eruptions, instead of being attended with scurf and scale, are accompanied with an elevation of the skin, which is covered with characteristic lymph into a white, soft, moist, flat surface, which discharges a white matter.—(Hunter.)

Dr. Anthony Cullen has pointed out what he terms as hepatic eruptions of the cuticle on the breast or abdomen, having the appearance of several blotches. Because that it is less deep in the skin; that it has only an inflammatory tone; and that it is not so deeply penetrated, as the true venereal blotch. It never forms a passing point; but is simply a fading, some scaling of the cuticle. This form of disease seems to him to be produced by a disordered stomach and liver.—(See Lect. Med. Jur. et. 7, p. 98.)

A venereal eruption often attacks about part of the finger in which the nail is formed. Here the disease involves the entire nail, which is soon falling through the nail, and if allowed to continue, a separation of the nail takes place.

When either part of the body covered with hair is attacked, the hair separates, and cannot be reproduced as long as the disease lasts.

Mr. Wilsont describes the true syphilitic eruption, as consisting of firm and slightly elevated spots, from which polices or scales are free, and prominent, sometimes detached. These spots are thick about the scalp, chin, forehead, and upper and lower part of the thighs. When these break, they commonly form slightly elevated crusts of a pale colour. On the palms of the hands, or sides of the feet, they are characterized by a thick honeycomb disposition of the same crusts. They are more disposed to superficial ulceration, when confluent, or in small degrees exposed

and meeting surfaces, as the angles of the mouth, axilla, and thigh, &c.—(See Med. Cur. Trans. vol. 13, p. 561.)

It must be allowed, that it is frequently very difficult to say, whether an eruption is syphilitic or not, and an opinion should rather be formed from the history of the case than from any particular appearance of the eruption itself. As Dr. Broussais has remarked, the venereal eruptions, which are the result of the venereal poison, are often misinterpreted, and considerable embarrassment to the practitioner. They assume such a variety of forms, that they defy definition by any arrangement founded upon their external character; and, in fact, they progress to various or exclusive states, by which their nature and origin are lost. Thus, in some, we see a series of catarrhal appearances, and scarcely any trace of species of the venereal eruption, which these secondary eruptions of syphilis do not occasionally resemble. Dr. Broussais admits, however, that, in every case, there is a difference, which a practiced eye will recognize, between the venereal diseases of the skin and the syphilitic eruptions, to which the other generic appellation might be given. This, says he, is often observable in the shade of colour, in the manner accepted by the eruption, in the mode of its distribution, and in the general complexion of the patient. Hence, to a person conversant with these ordinary diseases, a degree of accuracy in these respects will immediately excite a suspicion, which will lead him to investigate the history of the progress of such an eruption, and of its concomitant symptoms.—(See Broussais's Medical-Symptoms of Venereal Diseases, p. 211, 222, et. 2.)

Dr. Hunter does not pretend to be able to distinguish the true syphilitic eruptions from others, and, indeed, by what criterion they are to be known, and upon what point, as compared, with the observations factually established by recent experimental inquiries. Dr. Hunter generally approves of defining the use of punction at first, in order to see whether these eruptions affected will yield to other means; "but says he, I should not very long postpone the employment of the mild mercurial treatment, aided by warm bathing and sedatives."—(On Military Surgery, ed. 2, p. 388.)

Venereal Disease of the Throat, Neck, and Tongue.—In the throat, inside and outside of the mouth, the disease is said by Mr. Hunter generally to make its appearance at once in the form of an ulcer, without much previous inflammation. Consequently, the tonsils are not much enlarged.

A venereal ulcer in the throat was supposed, by the same author, to be, in general, tolerably well marked, though he observes, that it may not in every instance be distinguished from an ulcer of a different nature. Several diseases of the throat, he remarks, do not produce ulceration on the surface. One is extensive inflammation of the tonsils. The inflamed place often suppurates in the centre, so as to form an abscess, which bursts by a small opening; but never looks like an ulcer that has begun specifically, like a true venereal ulcer. The case is always attended with too much inflammation, pain, and enlargement of the parts to be venereal. Also, when it suppurates and bursts, it is visible directly, and it is generally attended with other inflammatory symptoms in the constitution.

Mr. Hunter then refers an ulcerated transfection of the inside of the throat in many persons, whose constitution is supposed to be syphilitic. The complaint progresses a thickness in the speech. Sometimes a papillary growth is thrown out on the surface of the palate affected, and various appearances attend, as by some called ulcers; by some, cancrs; and by others, gonorrhoic sore throat. The case is attended with too much swelling to be venereal, and, with a little care, it is easily to be distinguished from an ulcer or loss of substance. However, when this difference is not obvious at first sight, it is proper to endeavor to remove some of the lymph, and, if the surface of the mouth immediately should appear to be free from ulceration, we may conclude with certainty that the disease is not venereal. Mr. Hunter states, that he has seen a thick film with papillary growth, so as to appear very much like an ulcer; but, on removing the substance, the small artery beneath was found perfectly sound. He adds, that he has seen cases of a rounded mass having a thick in its centre, which slough, before its detachment, looked

very like a foul ulcer. The stage of the complaint, he says, is extremely puzzling when the abscess has come out, for then the discharges seem of the character of the venereal ulcer. Whereas he met with the disease in its first stage, sometimes treated as if it had been of the nature of syphilis, or a carbuncle. When the complaint is in its second stage, without any preceding local symptoms, he recommends the practitioner to suspend his judgment, and to wait a little, in order to see how the nature is able to relieve itself. If there should have been any preceding fever, the case is still doubtful as to be venereal. Mr. Hunter informs us, that he has seen a sore throat of this kind taken for a venereal case, and mercury given, until it affected the mouth, when the vesicles, located on a suppuration of all the parts concerned in the first disease.

Another complaint of these parts, which Mr. Hunter represents as being often taken for a venereal one, is an ulcerous excoriation, which sometimes affects the surface, becoming very broad and sometimes deep, having a regular termination, but, upon going deeply into the substance of the part, as Mr. Hunter believes the venereal ulcer does. No part of the inside of the lip is exempt from this ulcerous excoriation; but, according to Mr. Hunter, the disease most frequently occurs about the root of the tongue, and spreads forwards along the palatine arch. He remarks, that the complaint is evidently not venereal, since it does not yield to mercury. He believes these ulcerous excoriations continue for weeks, without exhibiting any change, and during several other make its appearance on the surface of the cross-bone joint. He says that such excoriations were cured by leeches, after the end of the venereal course, by which the syphilis was now cured.

This writer describes the true venereal ulcer in the lip, as a *fungus* of substance, part being dug out, as it were, from the body of the lip itself. It has a determinate edge, and is characteristically firm, having thick white matter, like a slough, adhering to it, and not resembling being washed away.

According to the experience of one late writer, the ulceration of the mouth is attended with little pain at first, and excavates the part deeply, and often is a triangular form, as if the lip were split. It slowly acquires a smooth white surface.—(Wellcock, in 35th Ann. Trans. vol. 12, p. 598.)

Here, however, as in most other suppurated forms of syphilis, some tend to healing, by which the case may be completely distinguished from other diseases of the throat presenting similar appearances: for, as Mr. Ross has very truly remarked, "the excavated ulcer of the tongue, as described by Mr. Hunter, is not, as Mr. Cruveilhier seems to think, a peculiar symptom of the progress of the syphilitic virus. I have repeatedly seen this well as the scaly blotch, in cases where mercury had been freely employed for the primary virus, and in which I considered the virus as eradicated, and which have disappeared under the use of antisyphilitics."—(Med. Cas. Trans. vol. 5, p. 221.) In a recent work, Mr. Cruveilhier himself acknowledges the justice of the preceding observations, and avers that when the ulceration of the tongue, he has often noticed the excavated ulcer of the lip, often attended by the binary palmaric ulcer, or the train of constitutional symptoms which arise from it.—(On the Symptoms, &c. of Venereal Disease, p. 37.) In affection of the throat, Dr. Hennen says, that he "would be more guarded than in any other in the employment of mercury, until an inflammatory disposition was removed." A patient he has with these glands, "as if by magic, as soon as the local effects of mercury on the parts within the mouth became obvious." But, when mercury was given orally, he has seen a real number of instances in which immediate relief was lost.—(On Military Surgery, vol. 2, p. 528.)

According to Hunter, the venereal sometimes produces a thickening and hardening of the tongue, but frequently ulcerates, as in other parts of the mouth. He describes venereal sores on the tongue as generally more painful than those on the skin; but less so than common venereal sores from ulcerated canals. They excite the patient to speak thick, as if the tongue were too large for his mouth, with a small degree of swelling. Mr. Hunter thought the relief of a venereal ophthalmia, but that one form of it arises from this cause, is in general a fact universally admitted. Another subject of this, in the same ophthalmia.

Symptoms of the second stage of Last Venereal.—The penicillium, herpes, herpes, ligaments, and being in the parts which Mr. Hunter sometimes so fully and affecting in the second stage of last venereal. These symptoms, in its full extent, however, appear to be ascribed rather questionably, as it would appear that the evidence both of vesicles and nodules seems that they are of venereal origin, of the kind, and being deeply carried, rarely take place from syphilis, and may carry to syphilis. It is an observation of Mr. Hunter's, that we cannot always know with certainty what parts may become affected in the course of the disease. He says he has known the vesicular produce a total deafness, sometimes followed by suppuration, and great pain in the ear and side of the head. These are fully explained, that it was one of the venereal's doctrine, that the second order of parts was generally deep-seated. When these "nodules" arrived at the point, he observes, that the progress of the disease is more gradual than in the first order of parts. It sometimes very much the character of venereal eruptions, or chronic inflammation; only it differs in the parts are frequently than the latter, afflicting also. A swelling sometimes involves the appearance of a hole, and there has been possible means of catching or poisoning for many months; and, in consequence of the little pain experienced, the patient may be in considerable ease before it is noticed. Sometimes a granular of parts is felt; but no swelling exists in the latter, as long as it is. According to Mr. Hunter, these nodules are also applicable to swellings of the tongue and lip. As numerous of this kind can become very dangerous, they are localised with syphilis, as such inflammation. When they attack the pharynx, they seem like an enlargement of the tongue, and in some cases of being very firm, and closely connected with the latter part. Mr. Hunter also notices that, in these advanced stages of the disease, the inflammation can hardly get beyond the pharynx, but is held up; it continues to become more and more, and often matter is formed if it is not removed, but a sharp dissection. Some, indeed, he says, are of the tedious and long, but for years, before they become matter in it. These cases he considers as being actually venereal, though commonly considered as such. Mr. Hunter found it difficult to explain this, why, when the venereal attacks the base of the pharynx, the pain should sometimes be insupportable, and sometimes very trivial. Venereal pain in the base are described by Mr. Hunter as being of a peculiar kind, peculiarly most severe in the night time.

At the present day, when many cases formerly supposed to be syphilitic are treated without any mercury, and even those which are reported to be treated by such by much smaller doses of that medicine as were given in Mr. Hunter's day, nodules have become much less frequent; and I have already, in a certain part of this article, expressed my decided belief in the progress of the opinion given by Felsing and some that a disposition to nodules is often removed by its attack of mercury.

Treatment of Last Venereal.—In Mr. Hunter's view, the first order of parts, or those which are not susceptible of being affected in this manner, as far as the most easy of cure; while the second order of parts takes more time to be removed.

In the case of complaint arising in the second order of the last venereal, Mr. Hunter believed that the tendency in condition the long-point of mercury till all the swelling had disappeared. For a is observed by this distinguished writer, that, even high local complaints cannot contravene the influence by mercurials, and have the internal disposition and action from the constitution can be treated with the local effects and means, and even even when in condition, keeping order on the local state, it has proceeded to suppuration, there can be no reason for continuing the course after the venereal virus has been destroyed. Whatever may be benefited by covering the immensity of mercury as it tends to many secondary symptoms, one thing seems which will do us no harm, that it should always be combined with mercurials, but it produces little effect, and more terrible diseases than those which it is intended to relieve. For an account of the various ways of exhibiting it, I must refer to the article *Mercurial*. Dr. Depaul adopts the notion, that the mercury brought

of the venereal disease are been successfully treated by irritating mercury into the system from the surface of the body, and, if possible, partly through the mucous set of absorbents as first took up the virus; for the rate of secondary suppuration he predicts the time and—(Clib. Cils. 1-2.)

To the following arguments concerning the operation of mercury, and the principle by which its administration should be regulated, surgeons of the present day will not give more credit than time warrants; because none of Mr. Hunter's opinions are justifiably influenced by the hypothesis that mercury is absolutely necessary for the cure of the venereal disease.

In curing the late venereal mercury can only have two modes of action, once on the poison, the other on the constitution. It says Mr. Hunter, mercury acted on the poison only, we might suppose, if it did so either by destroying its quantity, by decomposing it, or else by arresting it, and carrying it out of the circulation. If mercury acted in the first of these ways, one would expect that the cure would depend on the quantity of the mercury taken into the system. If it acted in the second manner, one would infer that the progress of the cure would be proportional to the quantity of excretion. For observes Mr. Hunter, if it act upon the principle of destroying the chemical action of the living parts, and of counteracting the venereal irritation by producing one of a different kind, then another quantity above our excretion will send much. He states, that the progress of the cure depends upon quantity joined with specific effects. However, it is sufficient to observe that the effects which mercury has upon the venereal disease, are in some degree proportional to the local effects of the medicine on some of the glands or particular parts of the body, as the mouth, skin, kidneys, and intestines, yet such effects are not altogether proportioned to those other circumstances. When mercury disagrees with the constitution, so as to produce great irritability and hectic symptoms, this action of irritation, as Mr. Hunter explains, is not a counter-indication to the venereal disease.

It was also noticed by the same author, that the effects of mercury when secreted are always in proportion to the quantity of the mercury excreted in a given time, and the susceptibility of the constitution to the secreted irritation. He says that these circumstances regulate the most salutary effects, and that, in order to obtain the greatest action of mercury upon salivary, and in the most efficient manner, the medicine must be given till it produces effects elsewhere. However, it must not be continued too quickly, in order that a sufficient quantity may be given before we are obliged to stop, in consequence of the effects. Mr. Hunter states that when the local effects are produced too quickly, they prevent a sufficient quantity of the remedy from being taken into the system to counteract the venereal irritation at large.

Mr. Hunter observes his having seen some cases in which mercury acted very readily locally, and yet the constitution was hardly affected by it, so the disease would not give way. He states that he has met with other cases, in which the same quantity of mercury did no answer, till it was given so quickly as to affect the constitution, so that it remains so to produce local irritation, and, consequently, salutary excretion. This, he observes, is a proof that the local effects of mercury are when the size of its specific effects on the constitution is large, and it shows that the susceptibility of the diseased parts to be affected by the medicine is in proportion to its effects on the system. Its effects, he concludes, are not to be judged of practically, but to its irritation. Hence he concludes that mercury should be given, if possible, in such a manner as to produce salutary effects upon some parts of the body, and in the largest quantity that can be given to produce these effects without fatal results. Mr. Hunter also remarks, that these salutary effects should be the guide of determining how far the specific may be pushed, so as to have the greatest effect on the disease without endangering the constitution. The practice must vary according to circumstances, and if the disease be in a slight degree, less mercury will be had to the constitution, and mercury will be thrown less on the system in large quantities; a very disagreeable mistake, as far as I can judge from many cases in which I have seen it acted upon.

Mr. Hunter observes again, that when the disease is in the first order of purity, a smaller quantity of mercury is necessary than when the second order of the poison is affected and the disease has been of long standing; its first appearances alone being cured, and the venereal disposition still remaining in the secondary state. For the purpose of curing the venereal disease, whether in the first of classes, lues, or late venerea, Mr. Hunter was of opinion that probably the same quantity of mercury is necessary. He supposes that one ounce of mercury at such quantity as the virus is the same person, and a small one as much as a large one. He thought that the only difference, if there is any, would depend upon the nature of the parts affected, that is, on their being entirely active or passive. He conceived, however, that, on the whole, recent venereal symptoms accordingly were difficult to cure than the symptoms of late venerea, and that this may be the difference in regard to the quantity of mercury necessary.

Having now delivered the principal general instructions relative to the exhibition of mercury in the treatment of the venereal disease, as given by Mr. Hunter, I must not quit this subject without remarking that even this eminent surgeon appears on the whole too partial to the long use of mercury, and sometimes to the introduction of immoderate quantities of it into the system. In practice, however, his observations tend to moderate all violent actions. It is to be considered that, in his days, lues had a reputation that truly epidemic; but this reputation is allowable, with the caveat he himself has distinguished by their appearance, would in the end spontaneously heal, and he himself had no dependence upon any medicine except mercury for the cure of the late venereal disease. But consider experience evinces that the disorder seldom more promptly itself to itself so had and intractable as formerly; that it is even capable of spontaneously curing; and that the tardy even cases in which it is requisite to give mercury, require a very moderate quantity. Indeed, such is the change, that many surgeons expect that the very nature of the disease must have undergone a material alteration or modification. In England, in my opinion, every thing is to be referred to the improved science of exhibiting mercury only in moderate doses, and never pushing to exhaustion till the constitution was required that is tolerable form of disease cure, which encompasses the compound effect of mercury and syphilis together; and, in other instances, of this description which experience frequently call applied to phlogoplastic, and depending upon the venereal poison at all, but upon a state of the system, which mercury is known to aggravate in the worst degree. For additional information concerning internal remedies for the venereal disease, see Mercury, Quinine, Mercury, Mercuric Acid, Nitric Acid, Sarsaparilla, Sulphuric Acid, &c.

With respect to the local treatment of the symptoms of late venerea, Mr. Hunter thought that some would in general be necessary, since the constitutional treatment would commonly effect a cure. However, he admits that sometimes the local effects will not give way, and the parts remain swollen in an indolent, but increased, even after there is every reason to believe that the constitution is perfectly cured. In such cases, he recommends assisting the constitutional treatment by local application of mercury to the part, either in the form of a plaster or ointment. The latter application, he says, is the best. When time is not sufficient, he attempts to attempt to be made to assist in the formation of mercurial lues. He says, he has seen a mercurial cure, which goes throbbing parts, and by itself having an injection down to the whole length of the veins. The pain ceased, the swelling decreased, and the cure lasted up kindly, without the assistance of a grain of mercury. He mentions that lues have been applied to some of the various, removing the pain and taking away the swelling.

With regard to these late cases, I may add that, for many years past, the use of constantly dispensing cases by mercury has been entirely abandoned by every of the best practitioners; and, in general, best instructed medical persons for the cure of such venereal cases are easily distinguished. When such moderate quantities of mercury have been then sufficient, a skin is applied over the swelling, and kept open; and

which give the tumour generally external, as far as its extent will allow.

Disease resembling the Venereal. *Prædisposition.*—Seen on the glans penis, prepuce, &c., in the skin of children, as Mr. Hunter says, may and do arise without any venereal infection; and sometimes they are a consequence of former venereal sores which have been cured.

The symptoms produced by the venereal poison in the constitution, are such as are common to many other diseases. For instance, Mr. Hunter remarks, that blotches on the skin are common to what is called a scrofulous habit; pains are common to rheumatism; swellings of the bones, periosteum, &c., are in many and various periods of the scrofulous and strumous kind. Thus, says he, most of the symptoms of the venereal disease, as all its forms, are to be found in many other diseases. Hence, the original cause, and many leading circumstances, such as date, effect, &c. of the disorder upon which, from occasion, when very local, the possible and probable symptoms, &c. must be considered, before an use is made, absolutely what the disease truly is. All the circumstances and symptoms taken together may be such as will afford no other disease. However, Mr. Hunter confesses that, with all our knowledge, and with all the application of that knowledge to suspicious symptoms of this disease, we are often mistaken, taking symptoms common which are not it, and sometimes appearing really syphilitic affections to be of another nature.

Mr. Hunter takes notice that, in some constitutions, rheumatism, in many of its symptoms, resembles the venereal. The nocturnal pains, swelling of the tendons, ligaments, and periosteum, and pains in loose articulations, are symptoms both of the rheumatism and also of the venereal disease, when it attacks such parts. Mr. Hunter, however, did not know that he had very early the first venereal attack the joints, though many rheumatic complaints of such parts are cured by mercury, and therefore supposed to be venereal.

Mercury, given without caution, often produces the same symptoms as rheumatism. Such complaints Mr. Hunter has used mistaken for venereal ones, and mercury continued. He explains that some diseases not only resemble the venereal in appearance, but in the mode of continuation, proving themselves to be poisons by affecting the part of excretion: thus producing immediate consequences similar to buboes; and some remote consequences similar to the liver disease.

Mr. Hunter observes, that it is nearly as dangerous to give constitutions to give mercury when the disease is not venereal, as to omit it in other cases which are really syphilitic; and, had he been acquainted with recent investigations, he would undoubtedly have gone further, and decided that it is in reality far more dangerous. Many of the constitutions which put on some of the venereal symptoms when the disease is not really present, he says, are those with which naturally scrofulous system, and especially the lues. He had seen mercury which was exhibited for a supposed venereal ulcer of the thistle, produce a mortification of those glands, and the patient was totally destroyed. No doubt this was an example of what Mr. Cammack would call the phlegmatic venereal disease.

Mr. Abernethy, in his *Surgical Observations*, 1804, has traced at some length of diseases resembling syphilis, and has added several very interesting cases, which I believe every student practising to read with the greatest attention, as they contain the views of the subject fully established.

"A patient says he thought that he had received a slight cut on the hand (which was extended to the first and middle fingers) with the discharge from a hole in the finger, that he had begun to recover. The wound healed after it was about the size of a sixpence, which he supposed was, and which I affirmed had not the thick red edge and hard, and other characters of a venereal chancre. I therefore recommended him to try the effect of local issues, and not to use mercury."

In about a month, the sore, which had opened with the disease described in its appearance, and assumed a healing appearance. At this time, when the patient extended the arm, and suddenly a considerable quantity rose over the absorbing vessels, which passed along the inner edge of the large vessels. This quantity became nearly as big as a small grape. As this singular

and unknown depend on heat, and as there was no surrounding inflammation, I could not believe it venereal, and therefore recommended him still to abstain from mercury, and apply leeches and linen poultices to the arm, resting, and compress to the venereal part, and the inflamed abscesses. For it seemed to me that the venereal poison had been expelled from the sore, and would have caused inflammation and suppuration to take place there more slowly than had occurred in the present occasion.

Under this treatment the sore was healed, and the rest of the arm then healed. About two weeks afterwards the patient called on me, and said that there were venereal sores in his throat; and to each throat there was an ulcer deeply excavated, with irregular edges, and with a surface covered by granular matter; others, in short, which every surgeon who depends on his sight as his guide, would have pronounced to be venereal. Shortly after, this time, a new enlarged abscess appeared on his face and arm. He stopped his disease in several respects, as when opening the throat, who, without hesitation, affirmed that they were venereal, and that the constitutional disease had been long ago departed.

While the patient was looking over his history, in order that he might go through the remaining cases, he recommended thinking and reflecting on the particulars, pointing the finger to the abscess, a sign of the character of a hard crown abscess, and was, in short, what every surgeon tells is really only of his sight and touch, would, without reasoning, have called a true venereal abscess. I now told the patient that I was more inclined to believe his disease was syphilitic, from the nature and treatment, and the progress of this case with the rest of the arm. His surprise through differently, and I believe his very accurate and sensible mind was convinced that his health would be a sacrifice if he did not go to London to consult my opinion. He was preparing to return to a mercantile course, when very unexpectedly he called him suddenly into the country. In ten days, with great reluctance, taking with him venereal disease, &c.; and after a fortnight I received a letter from him, saying that he found his complexion improved in his journey, that business had prevented him from leaving the use of mercury for a few days, that he was found it was unnecessary, that his symptoms had almost disappeared, and shortly afterwards he became perfectly well.

Mr. Abernethy considers this case as the most unequivocal instance of cure of a disease which could not be syphilitic, he distinguished by symptoms of its greater experience from syphilis, and was, therefore, was undoubtedly of a different nature than is usually, it was of a different nature according to common opinion, then generally believed, but which some more sagacious have pointed to be destructive of buboes. All this time he refused to receive him within it in the foregoing columns. I still can remember them.

Some years ago the wife and was introduced at a society for syphilis. (See *Notes*.) In the presence of an officer being present in venereal disease it was first alleged, many symptoms have not appeared, though, in a female patient, has appeared, it has certainly been allowed, with some other symptoms, to require a kind of compensation with mercury, and admitted to be useful in venereal cases under certain circumstances. A great deal of this sort of argument on the effects of mercury is applicable most, it now explained by the imperfection of the diagnosis, and the important fact that the disease may proceed far beyond in time without any medicines whatever, though this case is sometimes long. In short, was first suggested the use of arsenic acid, has attempted to correct the alleged occasional failures by observing that the acid which he employed was not pure nitric acid, but an impure acid, containing an admixture of osmotic acid. He, therefore, was more generally recommended the use of a crystallized acid, containing three parts of nitric acid, and one of osmotic, which he administered internally, and also applied externally, liberally diluted with milk, until the gums were affected and profuse produced, and he continued every day an opium enema, when some constitutional effects occurred.

"The acid that I have used of late (says Dr. Abernethy)

to the intra-vascular; and it is formed by mixing together equal parts of the nitrous or uric acid and malarial acid. If these acids be in the state of combination they readily pass in the blood, and if the quantities be considerable, a great volume of gas is developed on their coming into contact, which distends every part of a horse, or, in extremely feeble individuals, every part of a human, to almost intolerable dimensions. I put a quantity of water, at least equal in bulk to that of the acids, into a bottle, and I add the acids to it separately. This method does not only prevent the unpleasant odor, but it tends to retain the chlorine, in which it is likely to deposit. It is well known, that the intra-vascular acid acts very readily on the vessels and earths, swelling, therefore, but glass or extremely well-glazed vessels of porcelain, should be used to contain it. Women who are bathing in some very well, and they should always be made as well as possible, compatible with their holding the body, at the time that they wish to expose to the bath. These things being duly considered, and we are able to avoid the bath with ease. In India, I have often observed the women who have been to the bath, but have not been satisfied, in general, with keeping the legs and feet exposed to it. In order to stain the bath after the first time, I have sometimes made third or a fourth part of it to be thrown away, and the rest replaced by fresh water and a proportional quantity of acid. To save the expenditure of acid, I have occasionally employed a portion of the bath in porcelain vessels, placed near the fire, but I find this very objectionable.

It is the very matter (testimony Dr. Scott) in given dimensions with regard to the degree of acidity of the bath. I have commonly made it about, or strong, as very weak strength, looking to the facts above. The strength should be regulated by the degree of irritability of the patient's skin. I may say, that although I like to know that it is strong enough to prick the skin a very little, after being exposed to it from fifteen to thirty minutes, yet I believe that even such an effect as this is unnecessary.

That the act of remaining in the bath in order to produce the greatest effect, is a matter of detail. I have kept the legs and feet exposed to it for half an hour at a time; but in some delicate people, sometimes one-half or one-third of that time. I have repeated these baths daily, or even twice or three a day. (See *Med. Chir. Trans.* vol. 5, p. 101.) Dr. Scott adds, that the more exposing the skin with intra-vascular acid sufficiently diluted with water, gives rise to the very same effects as bathing, and is more easily adopted. Fifteen or twenty minutes may be employed in the evening, though a much less time produces very material effects.

Dr. Scott has found the intra-vascular acid particularly useful even in this country, in that destruction of syphilis which is termed *proleptic syphilis*, and he attributes the beneficial effects to the chlorine, which is mostly combined in this compound. (See *Journal of Surgery and the Arts*, vol. 1, p. 225-231; *Lond. Med. Reports* vol. 7, p. 50; *Med. and Chir. Trans.* vol. 2, p. 172, &c.)

The only individual combination which I venture to draw from Dr. Scott's observations is, a combination of the fact of the generally available nature of syphilis, diseases without the aid of mercury. And I further observe, that though the intra-vascular bath may sometimes be useful, the great value of bringing it into disuse, is, in respect to an application to all forms of syphilis, for which neither this remedy nor even mercury will ever suffice. The nature of it has been most successfully employed of late years, but after the facts stated in this article, the alleged result of how much more must be entered with skepticism, and in particular the idea of these specific powers rejected.

The preceding notice is an elaborate one, upon the whole, as the question of the present state of our knowledge of the venereal disease, through the existing condition of conflicting opinions concerning the efficacy of the powers capable of inducing such a variety of results as are to be observed in syphilis affections, we are yet left in doubt as to what of the most important principles which ought to govern us in our treatment of specific diseases of the genital system. To Mr. Churchill the profession is in an especial manner indebted for such interesting matter on

the subject, and the facts which the more recent occurrence of the disease among the population may have furnished us are also to be cherished as of great practical utility. (See *Histories, Virgows, Gutter, &c.*)

The venereal mercury, and its syphilitic complications, who have appeared in the United States, deserve also to be treated with some care, inasmuch as not a few of these, from simple opportunities, have set forth many interesting views on these venereal questions.—See *Reviews in Philadelphia Medical Journal*, vol. 2. *Hygiene*, in *New-York Medical Reports*, vol. 1. See also vol. 4. *Acid*, in vol. 5. *Opium*, in vol. 3. *Mercury*, in *North Amer. Med. Journal*, vol. 1. *Water's Plan of Syphilitic Treatment*, in *Med. Communications*. *Proleptic Syphilis*, in *Med. Chir. Trans.* vol. 4, &c.]

Next to the question of the present day way to place our confidence in the satisfaction of opinion of Mr. Hirst, thus fully, and his doctrine of the identity of the poison of gonorrhea and syphilis, of his infallible diagnosis of chlorine, and, finally, his concept of the necessity of extensive salivation, have probably few advocates in America. Moreover, the latest investigations by Hirst and continental writers seem to have improved the title of possibility that such a claim could be made in behalf of these Hirstian principles.

That gonorrhea and syphilis originate from distinct poisons, and that moderate salivation only, or the merely salivating the system, is the influence of mercury, is as true as necessarily, is, perhaps, sustained by some of the most perfect specimens of the modern; and the foregoing authorities of Mr. John Hunter, of the London Lock Hospital, is relative to the inefficiency of the mercurial substance, have been discovered in the last time by pathological clinical dissection. I shall here insert as correct from an elaborate essay on mercury, by my friend Prof. Fuchs, written some time since, and the advocates for the mercurial system as were not so numerous as at present. The entire paper may be seen in *Hirsch's and Fuchs's American Med. and Pathological Register*, vol. 2, p. 4. To the introductory, what are the changes effected in the system by the influence of mercury? Dr. F. observes: "Little is known beyond concerning the possible nature of the virus of syphilis; the action which takes place upon the application of the smallest particle of mercuric matter to the human body, and the power by which it generates disease, converting it local into a general disorder, and thus producing an altered and vitiated state of the whole system, it must be admitted, are neither very known to the science, nor very clear in the reasoning process of man. The effects themselves, however, have been long and familiarly known, and from daily considering these, a rational theory may, perhaps, be formed of the manner in which they are produced."

That the power of specific diseases, as that of less venereal, small pox, &c., diffuses itself through the whole constitution, and produces into brown nature the general state of circulating fluids, seems to be more common to all than is understood of their peculiar character. Upon the introduction of a particle of venereal matter into the system, an inflammatory action of the part into which it is injected is excited; lymphatic action and mercurial matter of the same nature is generated. This process may be carried on to a greater or less extent, in a longer or shorter time, in different persons, before the specific external action is absorbed; and hence local inflammation is in some cases considerably advanced before the system becomes affected, while in others the mercurial action appears to be more or less to have made some little progress. The mercurial action, modified in its action by the degree of salivation, the condition of the part, and habit of body, is taken up by the absorption, and enters the blood vessels, whence it is conveyed to the general circulation, and produces its peculiar effects upon the constitution. The fluids themselves are therefore necessarily first affected, and as a consequence of their mercurial condition, the white threads are now become vitiated. Hence the modification of the nature of various coagula is increased mercurial; and hence, in the same principle, the generation of mercurial matter from a similar action, arising from the introduction of the other specific poisons. By the introduction of a specific mercurial matter into the body, its condition is changed from a healthy to a diseased state,

the local is transferred into a general disorder; the glands, and ultimately the system, become affected, and, according to the peculiar virus acquired, the whole constitution partakes in a greater or less degree of the venereal taint, whether it be syphilis, lues venerea, mercurial, &c." The theory of Mr. Hunter, and every theory which is salutary, changes, by creating a new specific action, and thus this is contrary to the specific factor lues venerea, is contradictory to the fact that two specific actions can exist at the same time, is shown by Dr. P. to be inaccurate and unsatisfactory, from the well-known fact, that it often happens that two specific diseases prevail simultaneously in the same individual, as we find recorded in the cases of Pilonis, Jenner, Haysmith, and others in the *Lancet*; and by every author on various diseases of an acknowledged specific character.

But the theory of Mr. Hunter is adopted to be overruled by other facts concerning the changes induced by mercurial action, for which I must refer the reader to the essay of Dr. P.—*Water, Med. and Phil. Register*, vol. 4, p. 480—492.

In addition to the narrative style of narrative in the treatment of these venereal, he remarks, "The action of mercury, though primary on the venereal system, is communicated to every fibre of the body, and produces a degree of rheumatism, acidity, and debility. When taken into the system, it manifests itself by a quickened circulation, gives the blood the disposition to stain the hairy coat when drawn, renders the pulse frequent and larger, increases the respiration, excites the temperature of the body, occasions a whitish fur on the tongue, and other symptoms of general inflammatory action. Its effects upon the secretions are still more apparent, producing a permanent flow of saliva, an increased action of the nervous vessels of the trachea, lungs, digestive organs, chyliferous vessels, and whole muscular system. It causes a copious discharge of urine, and in the smallest quantity excites an itching on the skin. In its excessive influence on the body, it produces an increased action of the absorbent vessels. These may be considered the same salutary effects of mercury, when its action is not particularly modified by the mercurial condition of the constitution." Dr. P., therefore, concludes, that from the very general stimulant operation of mercury in promoting the excretion of the whole system depends its curative action. "We further remark from these remarks, that from these perturbations of mercury which are here calculated to secure the general action, our next approved system of relief are to be drawn; and hence the difference between the two pills are to be perceived as possessing this character. We are still further strengthened in this view by observing the effects of elutriate on the venereal disease, and are enabled here better to appreciate the valuable facts furnished us by Mr. Carmichael. Accordingly, the persevering practice of Mr. Howard, and of the other writers, who advocate pure salivation have been resisted, and they that the treatment ought to "draw like a river," will find one of his objections to the present exaggerated state of knowledge. Indeed, it seems to be well established, that where salivation is early excited by a too free use of mercury, our chances of a permanent efficacious cure are actually lessened, and sometimes entirely cut off."

"There is another circumstance connected with the action and effects of mercury on the human constitution, which, though it does not strictly come under the consideration here, may nevertheless be mentioned. I allude to its propensity to the ulceration which a mercurial salivation produces, becoming a point of interest in judicial medicine as well as in practice. It seems to be well established on practical authority, that salivation, having commenced, when it is attended with marks, may readily be reversed by the slightest dose of mercury. Hagedorn and Howard, of the Lock Hospital give us facts of this sort. Mead mentions a case where the salivation was six months, and Hagedorn, of Edinburgh, relates a case of a long nature. In his lectures on venereal medicine, Dr. Francis informs us he has recorded two instances of a similar sort as his own practice, in which a few grains of mercury reversed a salivation which had been suspended for several weeks in one case, and in the other for more than eight months. The inference to be deduced from occurrences of this nature renders it necessary for us to enquire into the inquiry, whether the point should be aimed to mer-

cure for the cure of venereal disorder does to him as least practitioners under the operation of mercury, as perhaps ungenerously occur, and this I think is a question deserving consideration. The fact is, that mercury is given sometimes in syphilis, ought to be given in a constitutional propensity, prepared for the purpose, the power of the system after mercury is to be removed is much before we commence. With this entire acquiescence we shall find that such, or some other, all things be calculated before commencing with mercury in constitutions acquired by leprosy, and other causes. Dr. P. informs us, that in some instances he has given it as a salutary preparation directed to general, especially in cases of long-continued syphilis, some mercury had been previously anti-syphilitic."

The Institute of gold has not been attended with the success in the treatment of syphilis as was expected, which might have been expected from the effects of its chemistry alone. In my own practice it has been used in this city, it has proved to be best, that in some cases where mercury was considered only first, it was employed chiefly to diminish the pain, and diminish the venereal salivation occasionally induced by mercury. The learned Dr. Munk, formerly, of the practice of the New York Hospital, in which he introduced the method of Columbia in 1811, that that metal was capable of effecting salutary results. "Without pretending to affirm, that it is better to Dr. Duchamp (*Edin. Dispensary*, June 15, 1825), that it is capable of inducing the development of every instance, my opinion upon the whole is, that the nature of gold will effect it, but is not proved by patients of syphilis." Still more recently, but has been covered in satisfaction the cause of various preparations of mercury to the use of various success; and the article of 1822 is almost unchanged in his practice of gold as an anti-venereal remedy, as was Salvo's of 1806, which he pronounced it capable of radically drying all venereal humors and clearing out of the human body, syphilis and the French, because it purified the blood, and thus brought to the source of the disease. I feel assured, however, on testimony of Anthon's experience and success in his experiments, that their efforts will be made with that of the Academy of Paris, who, with the venerable Pavy at their head, have reported unanimously on the subject, and declared the metallic power of this substance remedy with some to be platinum and copper. (See father *Journal*, vol. 10, p. 111, written by Dr. Berthol.) For a variety of experience with the nature of platinum in syphilis, I must refer to the *Edin. and Science Med. art.* March, 1820. I am not aware that this article has ever been used by American physicians.

The author has made reference to the British paper of the late Mr. Hey, in the *Medical Agency*, *Trans. of London*, vol. 7. That paper is a valuable contribution to our stock of knowledge of venereal diseases. Mr. Hey is one of the earliest authors who support the opinion, that the venereal disease is capable of affecting the human system, as do the sermons of Mr. John Deane upon our condition in what the venerable Hey has advanced—*the Physician's Life of Hey*. That cases of this kind are already noted under the observation of the most practitioners cannot be denied; I have recently seen the disease thus reported. Many seem to be giving to prove sufficient on this point, and of this nature are also furnished by Professor Brown in his *Medical Essays*, vol. 2, and I myself, the author in some detail cases given by Professor Brown, his revised edition of Dr. Denham's *Medicine*. "I have, but under my own care," says Dr. P., "a case of the venereal disease communicated to us better in fact; two of these were venereal and the general system appeared in a perfectly sound state. Another three were others of the same kind, and venereal disease. In two the disease was apparent only after birth, and in one had been long elapsed before the disease manifested itself. Cases thus contracted are doubtless but rare, but the frequency of the venereal disease and the venereal disease in fact we can meet occasionally with the solution. See also *Dispensary*, Dr. P. *Pathology of the Venereal Disease*, who contends that an individual caught by mercury may communicate the disease. A valuable paper containing cases of venereal disease of the 19th

curved state of the laminae of the secondary cartilage of the ordinary lamina; a union of vertebrae and tail, and occasional escape of the muscles of the vertebral column. But, as Mr. Brodie observes, very similar symptoms may arise from other causes, and sometimes no particular symptoms are made prescriptive in the actual discovery of the curvature. (On Diseases of Joints, p. 270, 280.)

I have already mentioned Mr. Brodie's opinion, derived from dissection, that in many instances talipes of the spine has its origin in an alteration of the intervertebral cartilages, beginning in their centre, and extending to their circumference, and afterwards affecting the bodies of the vertebrae, which, in some cases, in other cases, the disease has its origin in the bodies of the vertebrae themselves, which are liable to the same peculiar disease of the spongyous structure, which is noticed in the vertebrae themselves of other bones. (On Diseases of Joints, p. 287.) This gentleman suspects that the disease, which begins in the cartilages, is the intervertebral cartilages, and that the first form of the disease, which becomes so extensive a destruction of the vertebrae, is the last. But (says Mr. Brodie) further than this, nothing which I have hitherto observed enables me to point out any circumstances in which the symptoms of these different diseases differ. (P. 284.)

Remembering another element, that when the laminae become so much affected, the symptoms depend on pressure or irritation of the spinal vertebrae, I cannot say that I accords with several cases which have fallen under my own notice; that is to say, if the affection of the lower limbs is to be considered as a sort of mark, limited or positive.

According to Mr. Pott, the true curvature is generally bilaminar, it being three spines outwardly, and it varies in extent, in extent, and in degree; it affects the neck, the back, or the hips; it comprehends one vertebra only, or two, or more; and as one or more are affected, or as three or four are affected, the curvature may be different.

In these cases, as Mr. Brodie remarks, "the distortion of the spine is usually of a peculiar kind, and such as nothing can produce except the destruction of the ligament of one or more vertebrae. The spine is bent forwards, so as to form an angle posteriorly; and although the destruction of the vertebrae may be the cause, it is more evident in some parts of the spine than it is in others. For example, the spine processes in the middle of the back being long, and projecting downwards, the elevation of one of these must occasion a greater prominence than that of one of the spine processes of the neck, which are short, and stand directly backwards."

Curvature of the spine, in the direction forwards, may arise from other causes, as a weak condition of the muscles, or a palsy, affection of the bones. In general, in such cases, the curvature comprehends the whole spine, which assumes the form of a segment of a circle. At other times, however, it occupies only a portion of the spine, usually that which is formed by the superior laminae and inferior dorsal vertebrae. But here, as Mr. Brodie has said, the curvature is always gradual, and never angular; a circumstance by which it is distinguishable from the curvature produced by cause. The cause, however, he thinks have often been contributed, and some speedily and completely cured of curvature more or less, he thinks, must have been cured by an entirely different cause. (On Diseases of Joints, p. 280, &c.; and *See*, in *Edinburgh Medical Journal*, Nov. 1855.)

"Lateral curvature of the spine is alleged generally to incline to the right side, and the fact is related (with what correctness I have not in the review process which is acquired by the spine present use of the right arm, and of other members in the performance of the voluntary actions." (On Diseases of Joints, p. 281.) It is admitted, however, that exceptions are not very rare, and that the lateral curvature sometimes tends to the left, and occasionally sometimes the latter is reversed. On this subject I have also another case exception to specify, which is explained by Mr. Brodie, viz. that though lateral distortion of the spine generally arises from causes independent of cause, a slight degree of lateral curvature is in some instances produced by the bodies of the vertebrae having been

destroyed on one side by caries, in a greater degree than on the other. (On Diseases of Joints, p. 284.)

In general, the lower limbs alone usually feel the effect. Mr. Pott, however, has seen two cases, in one of which the arms only were affected, in the other both legs and arms. Mr. Pott observed that a lad who had lost the use of both arms and legs from a carcinoma. An account of this singular example was also contained in Mr. Pott by Mr. Parks of Liverpool.

Mr. Brodie has never known the palsy affect the muscles of the arms; when the disease was at the lower or middle part of the spine; but he agrees with Mr. Copland, that the symptoms are not always confined to parts below the disease, and that it is not an constant for pain in the upper extremities to accompany the palsy in the lower limbs and thighs. (On Diseases of Joints, p. 285. Copland, *Obs. on Distorted Spine*, &c.)

Very soon after the curvature, some patients are rendered totally and absolutely incapable, not only of walking, but of using their legs in any manner; others can move about with the help of crutches, or by grasping their thighs just above the knees with both hands. Some can sit in an armchair without much trouble or fatigue; others cannot sit upright any longer. Others retain such a degree of power of using their legs, as to be able to shift their position when in bed; others have no such power, and are obliged to be moved upon all occasions.

I have been present at the dissection of persons who died of laminae distortion, and who, while they lived, never suffered the peculiar form of the lower extremities, as well described by Mr. Pott, though the vertebrae were found to be diseased. However, in some instances of such diseases, attended with distortion of the spine, the legs are deprived of their power. In relation to the difference in the curvature, the consideration that it is sometimes the disease of the lower limbs is secondary, and the disease of the spine is primary, I cannot determine. At all events, paraplegia is frequently only an effect, the curvature existing long before the disease; and in such cases, the legs are affected. Some time ago, Mr. Dandy, of Scarborough, consulted me about a case, in which the latter facts were ascertained. Mr. Brodie's opinion that paraplegia takes place at an earlier period, in cases where the disease begins in the spongyous structure of the bones, has been already noticed. In having a tendency to acute paraplegia, and in producing the weakness of the lower extremities, the present disease of the spine appears to be materially different from the absorption of the vertebrae, sometimes caused by the presence of morbid and other humors. (On Diseases of Joints, p. 280.)

Mr. Pott observes, when a child appears to be what the common people call naturally weakly, whatever complaint it may have are supposed to be caused by its weak state, and is generally believed that time and exercise will relieve them; but when a curvilinear has made its appearance, all these marks of weakness, such as laborious respiration, hard cough, quick pulse, listless face and limbs, pain and rigidity of the muscles, &c., are mercifully ignored and set to the account of the deformity consequent to the spine, more especially if the curvature be of the dorsal vertebrae, in which case the deformity is always greatest; but whenever will carefully attend to all the circumstances of the disorder, will be convinced that most, if not all the complaints of children laboring under this deformity, proceed the curvature, and that a mortal state of the spine, and of the parts connected with it, is the original and primary cause of both.

Among many other reasons for thinking that an effect was mistaken for a cause Mr. Pott enumerates the following:

1. "That he did not remember even to have seen the useless state of the limbs from a mere malformation of the spine, however cured with immobility might have made it."

2. "That some of these deformities from right shape which growing girls are so liable to, however great the deformity might be, was not attended with ill effect."

With respect to the treatment of distorted spine, I think was principally laid down by Mr. Pott, and is now generally adopted, viz. that the primary and sole cause of all the symptoms is a distorted state of the parts,

thoroughly washed, and surrounded with dry compresses. This dressing adheres both to the toes and the fingers. I have very observed, close the great toe, and more frequently on the thumb, than any of the fingers. In regard, too, chiefly to young people: I shall have also seen a whitlow affected with it.—(Partridge, in Med. Chirurg. Hist. &c. p. 125, 126.)

The causes of whitlows are generally of a local nature. Whilst examining the swelling as the most essential, a surgeon, suddenly wounding the finger when it is exceedingly red; pricks with needles or other sharp instruments; and the introduction of irritating matter (as mercury in the finger). A surgeon, in operating for a felon, has been known to cut the finger, and have, in consequence of the accident, a very severe and dangerous kind of whitlow. Butcher also mentions a person, who had a spot, whitlow, whitlow, in consequence of a slight wound on the finger, in examining the head of a horse that had the glanders. Remains the danger of a whitlow depending on a splinter or thorn which sometimes lodge in the part. Very often no particular cause whatever can be ascertained for the complaint.

The first cure, which occurs, about the root of the nail, ought to be opened as soon as possible. When the pus is not abundant, the matter is not so general, and may be cut, near the root of the nail, and decompose, at least this part. When an effluvia opening is not made, the matter collects again. In general, a dissection of the whole takes place as far as the disease extends. When the inflammation has been very violent, and the matter has made its way as far as the root of the nail, the nail itself often grows gradually detached, when the detached portion of the root of the nail acts on the sensitive finger, and makes it more itching. Hence, the surgeon should repeatedly cut away at many of the former edge of the nail as he can, and substitute a little oil of turpentine on the edge of the nail and the skin, in order to keep the latter from being irritated by the former. In proportion as the nail and gradually separates a new one makes its appearance.

When matter lies under the nail, an opening should be made through the part as speedily as possible for the discharge of the abscess. In order to perform this operation, Raker takes the surgeon by scrapping the nail with a piece of flint till it is so thick, it can well be, without any further things with a bistoury.

In the worst species of whitlow, suppuration may sometimes be prevented, and the inflammation be removed by the timely employment of potent means. When the pain is violent, and some fever prevails, it may be advisable to bleed the patient. In a few severe cases, the application of three or four leeches to the affected finger has been known to produce prompt relief.—(Schwartz.) Thence, it follows, that applying a relief round the finger, little, and around the finger, nothing the first two parts with a leech, and the third with a leech of removing the inflammation. Parow advises the finger to be for some time immersed in water as warm as the patient can bear. Some recommend the external use of emollient spirit, or the hyposphragmatic; while others advise the affected finger to be plunged in warm solution of soap, or in warm lotion. When the whitlow is attended by a great, painful, and even the skin will not extrude, suppuration remains in the patient.

When the suppuration does not show by the fourth day, Raker recommends an opening to be made. Even when an abscess is discovered by opening of making a small incision in the skin of the joint, and by pipes, that although no matter made is discharged, the patient always derives relieve relief from the operation. The incision, he says, may either be made in the fleshy part of the disease of the last three days, when suppuration the subsequent inflamed pus, flattens the inflamed matter can be plainly felt, and, in this case, there can be no hesitation about the place where the opening should be made. However, it may be better to remark, that the opening should always be made sufficiently large. When the finger makes a violent puncture it soon closes again, and a repetition of the operation becomes necessary. When opening the abscess is delayed, the throbs of the finger renders easily becomes affected, as the matter may spread to a considerable extent under the skin. Sometimes it makes its way through the nail as whitlow,

and takes by the article. In this case, as soon as the nail has been opened, a discharge should be introduced into the opening in the skin, and the matter opening be washed with a history.

The third species of whitlow seldom affects the last phalanx of the fingers, but generally the second or third. In this case, Raker advises us never to defer making an opening longer than the third day. If we wait till suppuration happens, we shall wait till the tendons are destroyed and the use of the finger is lost. In the case under consideration, the matter is always of bad quality and very small in quantity. A dissection in the finger can seldom be left. However, in a few instances, the matter penetrates to the extremity of the finger or about the finger joints; but never enters in the palm of the hand, or near the wrist. In these circumstances the tendons are in general already destroyed, and a stiffness of the finger and hand is to be apprehended. When the complaint is the consequence of a puncture, the best plan, according to Raker, is to open to enlarge the wound; for, in this sort of case, all other methods are unavailing. It is not enough, however, to cut through the skin; the tendons there must submit to incision.

When a collection of matter forms towards the wrist, attended with violent pain in that situation, an opening must also be made there. If an opening should have already been made in the hand, a probe may be introduced into the wound, and another operation made in an oblique situation by cutting at the neck of the instrument. In the same way Raker advises an opening to be made in any part of the forearm, where great pain, or the symptoms of suppuration may indicate its propriety.

In the fourth kind of whitlow, early incision made downwards to the bone are the most certain means of obviating the danger. When such incisions are not made early enough, suppuration takes place, and the bone perishes. The cut is to be made in the place where the pain is most severe. When the first phalanx is affected, the incision may be made in front of the finger, but when the second or third is the seat of the complaint, the opening should be made on one side. However, in order that the opening may be useful, it is absolutely necessary to make it down to the bone. When the incision is delayed too long, a small quantity of unhealthy matter is usually detached, and the bone is found in the state of necrosis. As an inflammation can hardly be expected in this situation, it is best to remove at once the diseased piece of bone. When the last phalanx alone is affected, the finger remains as firm, with the exception of its root being a little shorter and flatter. When the disease, however, is seated in the first phalanx, Raker thinks it better to amputate the finger than remove the diseased bone, as the finger, if left, would always remain stiff and unserviceable.—(See *Deformation der Fingerglieder*, vol. 7.)

With regard to the treatment of the species of whitlow named by Mr. Whistler, says a surgeon, all local applications have in many instances proved quite inefficient, and the part has been amputated. The only best treatment which Mr. Whistler has ever seen relieve his complaint has been the excision of the nail, and afterwards the external application of escharotics to the affected portion. I have myself seen a similar plan successfully carried, and the applications which appeared to answer best were arsenical lotion, Raker's escharic, or a very strong solution of the nitrate of silver. Nothing, however, will avail, till the nail is removed, and its total separation sometimes takes up a good deal of time, unless the patient submit to the great pain of having it cut away.

In both cases of the so-called whitlow, Mr. Whistler tried with success the exhibition of mercury. It was given in small doses at first, and afterwards continued, so as to affect the gums in about twelve or fourteen days. When the system was in this state, the sores in general soon answered a healing appearance, and the whitlow, which gradually disappeared.—(See *Med. Clin. Trans.* vol. 5, p. 126.)

The J. R. Whitlow, of Charleston, S. C., informs me, that in cases of whitlow, when by neglect or untimely treatment the bone becomes necrotic, he has frequently preserved the member by a timely resort to the diseased bone. Previous work in the habit of using the probe, and when whose *Whitlow* & *Whitlow* ch. 22, 23

taining the use of the thumb and fore-finger, and the subject to follow the operation in such a manner as to be beneficial. Dr. W. has several times received the loss of the first phalanx, and twice that of the second, and still preserved sufficient dexterity of the member to use it with tolerable despatch. The other fingers, under similar circumstances, may be supported with out materially interfering with ordinary manipulations.

This disease is so often regarded as unimportant by kind practitioners, that in the cases alluded to, it is often important to be possessed of a remedial means at once to production and its abatement.—*See* *Fracture*.

WOUNDS. A great deal of the subject of wounds has been already considered in the articles *Gun-shot Wounds*; *Head*; *Injury of the Head*; *Neck*; *Hydrophobia*; *Pericardial Disease*; *Scabies*; *Typhus*; *Throat*; &c.

A wound may be defined to be a recent laceration of externally in the soft parts, suddenly occasioned by external causes, and generally attended at first with hemorrhage.

Wounds in general are subject to considerable variety in their nature, degree of danger, facility of cure, and the consequences which are to be apprehended from them. Some wounds are quite trifling, not extending more deeply than the skin and cellular membrane, while others are very serious and dangerous, penetrating the muscles, vessels, large blood vessels, and nerves of importance. There are also certain wounds which are not confined to the soft parts, but rupture the bones; such are, really, calcareous, which frequently separate at once from a portion of the plate, and the suppurated part of the skull. Many wounds of the head, chest, and abdomen require the organs contained in those cavities. In short, the varieties and the degree of danger attending wounds, in general, depend very much upon each of the following circumstances: the extent of the injury; the kind of instrument with which it has been inflicted; the violence, which the edges of the part have suffered, in addition to their division; the size and importance of the blood vessels and nerves which happen to be injured; the nature of the wounded part, as respect to its present power of healing freely, or not; whether the operation of the system at large, and life itself, can be well supported or not, while the functions of the wounded part are disturbed, interrupted, or suspended by the wound; the youth or old age of the patient; the good-nature or badness of his constitution; and the opportunities which there may be of administering proper surgical aid and assistance of every kind.

All wounds of considerable size or depth, not producing immediate death, are followed by more or less disturbance of the whole constitution; by a fever, which, on account of its being an effect of the local injury, is sometimes called *symptomatic*; and some times *suppurative*, in consequence of its being, as it were, the sympathy of the whole system existing with the wounded part. It is likewise frequently attended by a secondary fever, in consequence of the wound, or severe inflammation. A suppuration it will be found in another part of this work.—*See* *Fever*.

Wounds, especially those of the lungs and liver, and other tendinous parts, are necessarily productive of serious forms of constitutional disturbance, affecting to a violent degree the vascular system, and well known by the name of *fever of the wound*. Of this I have fully treated in another article.—*See* *Fevers*.

Profusely suppurating wounds, the cure of which is retarded by any accidental circumstance, invariably being on great debility, and a particular disturbance of the constitution, increasing, digestive, nervous, and other systems, known by the name of *fever of the wound*, which I have also delivered on at length.—*See* *Fevers*.

Another classification of wounds, often met with in crowded military hospitals, is a peculiar variety of suppuration, frequently supposed to be contagious, and already described in the article *Napoleon's Green*.

Besides these consequences of wounds, it is my duty to mention another very common one, which seems to be intimately connected with the patient's temperament or habit of body. I here allude to *erysipelas*, which may be excited by a wound, instead of healthy suppuration inflammation.—*See* *Erysipelas*.

I may as well here observe briefly about the various complications of wounds, namely, the absorption of callosities in the liver, lungs, around the joints, or in other im-

portant organs, attended at a considerable distance from the wounded part. These accidental suppurations in the liver and lungs, after injuries of the liver, have been ascribed by authors for the last sixty or seventy years. They have been noticed by Le Dran, Deharrois, and others; and they have again been recently brought into consideration by Mr. Ross and Mr. Anst.—*See* *Med. Chir. Trans.* vols. 14 and 15. The late war has corroborated, that they may depend upon the absorption of some specific matter from the wounded part, and as I have elsewhere detailed (see *Fract.*), the peculiar fatal symptoms of phlebitis, in which similar abscesses are frequently formed in the vessels of around the joint to the same cause, and under the influence of the inflammation along the track of the vein to the sinuses, and even the heart.

Wounds are distinguished by surgical writers into several kinds. viz. *Wound*, *punctured*, *contused*, *incised*, *perforated*, and *gun-shot wounds*. These are some of the most important divisions into *Wounds of the Head*, *Throat*, *Abdomen*, &c.

Of punctured wounds, and wounds of the lung, as is contained already been given.—*See* *Gun-shot Wounds*, and *Head*, *Abdomen*, &c. The other cases I shall now proceed to consider.

Incised Wounds.—An incised, otherwise it may be termed *sharp* or *cutting* wound, is a wound which is made with a sharp cutting instrument, which is usually a knife; however, it is attended with but trifling or no serious consequences, than any other kind of wound, wherever. The blood there only flows slowly down; they have suffered no laceration of the nervous system, and are therefore less likely to produce death, it is impossible to stretch, and they sometimes unite by being united again in a very expeditious manner.

Generally, sharp incised wounds heal more easily than contused and lacerated ones, which at the same time, however, may not say based on all accounts, considerable blood vessels may be injured. But in the case of incised wounds, apparently discharging the danger of blood and lacerated wounds, hemorrhage, and even death, to render the case in reality more serious, by so doing the uncorrected practitioners to be of to guard against hemorrhage. Thus, incised wounds often happen that on their first occurrence the bleeding is trivial; but the side of some large artery being lacerated, great violence at the blood of the artery may be liberated at length, a work in the hemorrhage, and in alluring, and even fatal, effects of blood to the result.

In cases of sharp incised wounds, the bleeding, which at once takes place from all the blood vessels, is a source of great useful information to the surgeon, inasmuch as it enables him to judge what kind of blood vessel is lacerated, even the hemorrhage, whether the blood vessels are large enough to demand the ligature, or the contrary, whether they are such as will close by themselves by slight pressure or not, and so forth.

In a recent sharp incised wound, where the blood vessels which the surgeon should endeavor to stop, without the least delay. The first and best thing requires his immediate interference, is the bleeding, which must be checked. The second is the removal of all extraneous matter from the surface of the wound. The third is the removal of the opposite side of the injury.

When the divided vessels are not above a certain size, the bleeding soon spontaneously ceases, and all surgical measures need be taken on this point. If the wound is large, and the vessels are of considerable size, and their situation is favorable for uniting, with or without, it is often advisable to shut the wound and apply compresses and a roller, under the have means to hasten, which always makes a certain degree of uniting and suppuration. However, though I have used this description, I should be extremely sorry to appear at all against the general practice in ligatures, whenever the wounded vessels are above a certain magnitude. In this circumstance, by the bleeding vessels is actually kept in a state of coagulation. When the artery is of considerable size, and its mouth can be readily seen, the most proper advice would be to take hold of it as a part of the vessel. In applying the ligature, the surgeon must take care to put the ends as well as another that the vessel will not slip, the result of the event, and for the purpose of showing the direction of the force necessary to repair

ing the ligature, the ends of the threads are generally turned up at it. The intention is obviously to prevent the taking up of adhesions, which are necessary and desirable.

These ligatures, of sufficient strength, are at present often applied, as well to large as small vessels, as a preventive, in the establishment of which the experiments of Dr. Jones, and the writings of Dr. Voisin, are generally remembered. One tail of each ligature should always be cut off before the vessel is closed, and there are many surgeons who prefer the method of cutting off all the ligatures, except what forms the knot immediately round the artery.—(Edinburgh, *Ann. sur la Pratique d'Aliment*, p. 29; *Lancet*, in *Med. Cas*, Trans., vol. 6, p. 154.) At the latter point, however, a few surgeons have advanced objections, particularly Mr. Gosselin, who only admits the utility of it in cases where the wound will not close by the first suture.—(On *Wounds of Wounds*, p. 54; and Mr. Erwin, of Norwich.—(See the *Lancet*, *Medical Repository*, vol. 7, p. 33.) The importance of the case used in the following experiments.

First, if the wounds do not unite by the first intention, the ligatures may interfere with the discharge, without any inconvenience.

Secondly, if cerebral ligatures of vessels are cut short, the wound may unite over them, and they may be found to decompose after an interval of every week.

Thirdly, if the large arteries are to be employed in the same way, and the wound made over it, the ligature may be detached from the vessel, and moving about it is an abscess, where it may be found at different periods, from one to seven, weeks; and this may happen, whether the vessel be directly compressed with a single ligature or divided between two ligatures, as is to illustrate the circumstances under which vessels are treated in operations.

Fourthly, if Italian silk, free as when, be put straight round, as into a glass, as a measure, or instead of modification, by, and compressing of sides together, it may require, in this situation, without exerting absorbent, or producing any inconveniences. The ligature may be thus applied to compress the artery for the cure of aneurism; but not to secure vessels divided in operations. If a distal figure be drawn sufficiently tight upon a vessel on the face of a lump to be excised, Mr. Gosselin perceived, that the utility of the vessel which he was secured, as it were, was lost.—(See *Lancet*, *Med. Repository*, vol. 7, p. 302.) It deserves attention, that the preceding instructions are clearly founded on experiments made upon dogs and dogs. For further observations, see *Observations, Mémoires, &c.*, *Lancet*, *Medical Repository*, &c.

The bleeding having been suppressed, the next object is to remove any extraneous matter, such as dirt, bits of glass, slabs of wood, &c., from the surface of the wound. Were the circumstances neglected, the play of nature the ligature sides of the cut by the adhesive inflammation, or by which is more frequently termed, union by the first intention, would be generally frustrated.

As soon as attention has been paid to the foregoing indications, the surgeon should put the lips of the wound in contact, and take measures to keep them there in this state until they have grown firmly together. The sides of incised wounds are kept in a state of apposition by means of adhesive plaster, in paper pessaries, the pressure of a roller, and, in a few particular instances, by the employment of sutures.

With respect to ligatures, as they excite pain, irritation, and some degree of suppuration, they should never be employed when the pain can be kept in contact without them. However, certain cases require them, and it is advisable to keep experienced witnesses that in other wounds of the ear, eyelids, nose, and lips, it is proper to use them.—(See *Lancet*, *Medical Repository*, p. 15.) An account of the several kinds of suture, with remarks on their employment, will be found in the article *Sutures*.

The best and most common method of keeping the surfaces of divided parts in contact is by means of strips of adhesive plaster. When they are to be applied, the surfaces should put the wounded part in position in the position which is most favorable to bringing the two of the wound together. With this view, a patient should generally be placed in which retains the skin and subjacent muscles. An excision should then place the edges of the wound as nearly together as possible,

and hold them in this state until the surgeon has secured them, by the continuance of strips of adhesive plaster, applied across the line of the wound. In general, it is proved by holding in between small interspaces of about a quarter of an inch between each two strips of plaster, by which means the wound cannot be widened in case of suppuration. Over these first strips, and so to be applied and kept in the place with other pieces of adhesive plaster. Then, if necessary, a plaster and compressure is to be put on the face, and, lastly, the bandage or roller is to be applied.

In the manner the fresh-cut surfaces are brought into contact, and to preserve them gently in this state, in the next point was which the surgeon should have in view. The wounded part should be kept in the position which was found the most favorable for approximating the sides of the cut at the time of applying the dressings, and the patient should be directed to keep the part in a perfectly quiet state.

When attention is paid to these circumstances, if all goes happily, then the two opposite surfaces of the wound grow together easily in the course of forty-eight hours, without any degree of suppuration. The process by which this disintegration is accomplished is well known, being supposed to be the result of union by the first intention. Besides the advantage of the cure being effected in this way with the greatest expedition possible, there is still another thing worth in favor of economy, preserving the method of healing wounds, which is, that the scar is much less than after any other mode of treatment, and the pain is covered with original skin, which is always much stronger than any which can be formed by a substitute force.

It is wonderful with what celerity union by the first intention takes place under favorable circumstances. In the course of three days, the large wound, made in the operation of amputation, is frequently all healed, except just where the ligatures are retained.

When the two sides of the wound have been brought together, before the healing of blood has entirely ceased, Mr. Denon conceives, that blood itself becomes the first bond of union; but on this point, Professor Thomson of Edinburgh, expresses a doubt; and all profess and surgeons agree, that the adhesion of blood on the surface of a wound is more likely to prevent, than promote, the union of the parts. In all common cases, what Mr. Denon calls the adhesive inflammation takes place. In two weeks, conglutinating lymph fills the space from the lacerated surface of the vessels, or from the surface of the opened cells of the cellular substance. This becomes the first applied medium, and very soon afterwards, in some insuperable manner, a vascular membrane is established between the opposite sides of the wound.

The power which parts of the animal body have of thus growing together, is strikingly evinced by the possibility of removing a part of one body, and then making it to some part of another. In this latter case, there can be no union given in the union of one side, since the detached part, as Mr. Hunter observes, can hardly do more than 140 pressure on its own living principles and attempt to heal. In this way, says the same writer, the space of the young cock can be made to grow on its comb, or on that of another cock, and afterwards, after having been removed, may be made to unite in the inside of any cavity of an animal.

Every one acquainted in surgery has heard of the facts of Tullius, Galienus, and others, who are said to have succeeded in effecting the union of parts, which were completely severed from the body. Several other not less extraordinary performances by modern surgeons are recorded.—(See *fact*, on *Adhesion*, with *case* *dissemination* of the *Parts of Nature* in *reproduction* *Parts* which have been by accident totally separated from the animal, See *Notes*, by *Wm. Bristow*, *London*, 1804.) Indeed, the post-mortem proof of the possibility of the union, the experiments of Dr. Hunter and Hunter, and the numerous and respectable characters of the testimony upon this subject, fully convince us of the possibility of union which may attend the endeavor to bring about such a union. Experiments also fully prove the frequent success of an endeavor to unite a part, which is united by the first intention of a small piece of flesh, or even a few shreds. My friend, Mr. Lawrence, attended a case which illustrates the truth of this statement. A man on the top of a stage coach was carried under a gateway which did not leave

the surgeon must carefully do it to take care of the health. When the wound does not suppurate favorably, the discharge generally becomes profuse, stinky, and glairy. This state is to be attended by bark, wine, rich diet, and good air.

I shall conclude this subject of union by the first intention, with an extract from the writings of Mr. Hunter, who observes, that

"It is with a view to this principle of union, that it has been recommended to bring the sides (or lips) of wounds together; but as the natural elasticity of the parts subsists some time, it has been found necessary to supply, not for that purpose. This necessity first suggested the practice of sewing wounds, and afterwards gave rise to various inventions in order to answer this end, such as bandages, working plasters, and ligatures. Among these, the bandage commonly called the *strapping bandage* is preferable in all the rest, where it can be applied; but its application is very confined, from being only adapted to parts where a roller can be used. A piece of sticking plaster, which has been called the *dry suture*, is more general in its application than the strapping bandage, and is therefore preferable in many occasions.

I can hardly suppose says Mr. Hunter, a wound is any situation where it may not be applied, excepting penetrating wounds, where we reach the lower portion of the wound to be closed equally with the upper, as in the case of the lip. But even in such wounds, if the parts are thick and the wound not deep, the sides will seldom recede in so far to make any other suture necessary. The dry suture has an advantage over stitching by bringing a large surface of the wound together, by reflecting the parts to which it is applied, and by continuing producing an inflammation, and absorption, which still keeps it close. When parts, therefore, can be brought together, and especially where some force is required for that purpose, from the skin will bring it close generally, the sticking plaster is certainly the best application. This happens frequently to be the case after the removal of tumours in scapulars, or when the sides of the wound are only to be brought together on one side, as in the knee-joint; and I think the difference between Mr. Hunter's cross-stitch suture operation as recommended in his *Crural Inquiry*, and Mr. Alcock's practice, states strongly the superiority of the sticking plaster for dry suture. In those parts of the body where the skin provides more than in others, this treatment becomes less necessary; and as the parts probably recede as little as any, it is therefore sufficient necessary to apply any thing is requisite of that part, the suture will certainly answer but is superficial wounds, because the distance is in these cases within its influence.

The sticking plaster should be laid on in strips, and these should be at small distances from each other, and should be greater of an inch at night, if the part requires this confinement; but when it does not, they may be at greater distances. This precaution becomes more necessary if the bleeding is not quite stopped, there should be passages left for the exit of blood, as the accumulation might prevent the union, though this does not always happen. If any sanguine body, such as a ligament, should have been left in the wound, suppuration will take place, and the matter should be allowed to rest at some of those openings or spaces between the strips of plaster. I have known a very considerable abscess formed in consequence of this precaution being suggested, by which the whole of the recently divided parts have been separated.

The interrupted suture, which has generally been recommended in large wounds, is still in every but useless process equal to the intention. This we may reflect to be the only one that deserves the name of suture; it was formerly used, but is now not practised, even laid aside as useless, and from the impossibility of uniting parts by this process, but from the accident, and mode of attempting it. In what manner better methods could be contrived, I have not been able to suggest. It is to be understood that the sides and ends of bringing wounded parts together in order to unite them, are only to be put in practice in such cases as will admit of it: for if there were a method known, which, in all cases, would bring the wounded surfaces into contact, it would in many instances be improper. At some wounds are attended with tumours, by which the parts have been more or less detached, in such

cases, as was formerly observed, union cannot take place according to the first principle, and therefore it is improper to attempt it.

In many wounds which are not attended with contusion, when the other layer is subject that extravasated blood has been introduced into the wound, union by the first intention should not be attempted, but they should be attended as suppurative, in order that the suppuration may be effected. Wounds which are attended with laceration, although free from contusion, cannot always be united by the first intention; because it is not frequently to be expected to bring the external parts or skin so much in contact as to prevent that suppuration which is naturally produced by disunion. But even in cases of simple laceration, where the external surfaces are not jagged, or can be presented (as we observed in healing of the compound fracture), we find that union by the first intention often takes place, the blood which fills up the interstices of the lacerated parts, having prevented the entrance of impurities; it then and prevented suppuration, and afterwards is absorbed.

Many operations may be so performed as to admit of parts healing by the first intention; but the possibility should be sought with great circumspection; the mode of operating with that view should in all cases be secondary, and not a first consideration, which it has already been too often being neglected. In cases of cancer, it is a most important object, as to prevent suppuration.

In the laceration of wounded parts by the first intention, it is hardly or never possible to bring them so close as to prevent the exposed edges as to unite them perfectly by these means; such edges are therefore obliged to unite another method of healing. If kept moist, they will inflame as deep beneath the cut surface as the superficial as the union, and these suppurate and form a scab beneath, and above the cut edges, thus inflammation and separation of these edges will be prevented, and this will complete the union, as will be described by and by.

As those effects of accidental injury which can be cured by the first intention call up most of the powers of the constitution to assist in the repair, it is not the least affected or disturbed by them; the parts are united by the extravasated blood alone, which was thrown out by the injury, either from the divided vessels or by coagulation of inflammation, unless a single point taking place even in one part there, except the closing or coagulation of the vessels; for the flow of the blood as it is considered as equally essential. Even in cases where a small degree of inflammation occurs, it is merely a local action, and is notwithstanding the coagulation is not affected by it; because it is an operation to which the power belonging to the parts themselves is fully equal. The inflammation may produce a small degree of pain, but the operation of nature gives sensation of any kind whatever."—*Hunter on the Blood, Inflammation, and How that Wounds.*

Closed and Lacerated Wounds.—*Lacerated* wounds are those in which the fibres, instead of being divided by a cutting instrument, have been torn apart by some external rupture of overstretching their force of adhesion. The edges of such wounds, instead of being straight and regular, are jagged or unequal.

The wire suture is applied to wounds lacerated by some blunt instrument or surface, which has violently struck a part of the body.

These two species of wounds greatly resemble each other, and as they require nearly the same kind of treatment, they usually treat of these together.

Lacerated and contused wounds differ from simple wounds in appearing, as first view, fresh and alarming than the latter, while, in reality, they are in reality more dangerous. In simple cut wounds, the attraction of the parts and humors are not so much considerable than in a lacerated wound of the same size. However, notwithstanding these considerations, they commonly admit of being healed with far greater ease. It is worthy of particular notice, that lacerated and contused wounds are not so general attended with any serious effusion of blood, even though large blood vessels may be injured. I say in general, because, in the year 1812, I saw a soldier whose death was ac-

drawn by a sudden effusion of a very large quantity of blood from the internal jugular vein, which vessel had been injured by a musket-ball, that had entered the sternum, and lodged in the mediastinum, and passed obliquely downwards and forwards towards the axilla. The blood did not issue externally, but formed between the integuments and the wound a large dark-colored swelling, which produced almost insupportable suffering. At the moment of death, the patient, Professor Ainslie says a surgeon, who left the patient, said that he was injured by a musket-ball, the depth of the wound being a few inches.—*Am. Journal of Medicine* at Chicago, p. 32, March, 1842.

It would seem, however, there is at least one instance of a musket-ball from a distant part of the body, and it is a circumstance that often leads to a misapprehension in medical practice, by inducing them to pursue too much in the pursuit which they pursue. Surgeons named in practice, however, do not allow themselves to be deceived by the absence of hemorrhage, and in proportion as there is little bleeding, they apprehend that the violence done to the artery and veins has been considerable. What is it, that the continued and increased nature of the trouble, that prevents hemorrhage from the vascular system, when actually divided and severed with their knife? What facts have frequently been taken from the body without any hemorrhage of consequence taking place.

In the *Phil. Trans.*, Crookes has recorded a very singular case, at which a man's arm was suddenly torn from his body. Samuel Wood, a writer, had seated his arm a horse, which was engaged with the wheel of the mill. He was afraid of the horse, and then, seized by a horse, which presented the back of his arm, at this instant the wheel, which was turning with immense force, completely cut and carried away his arm and scapula from his body. The appearance of a wound occurred in this manner, and it seems to be a very rare case. The first idea that occurred, was, naturally, that the patient cannot possibly survive. Samuel Wood, however, died with his life. The first had been torn off with such velocity that he was unaware of the accident till he saw his arm falling down on the wheel. He immediately descended by a narrow ladder from the wheel, and even walked some paces, with a view of seeking assistance. He soon fell down from weakness. The person who first came to his assistance, covered the wound with powdered sugar. A surgeon, who arrived at the spot, observing that there was no hemorrhage, was content with dressing the skin, which was very fine, so as to make it cover the surface of the wound. For this purpose, he used two coats of plaster. The patient was conveyed the next day to St. Thomas's Hospital, and put under the care of Mr. Fern. This practitioner employed the usual means for preventing the bad symptoms from being expected in this sort of case. The first dressing came away without any bleeding; no alarming consequences ensued; and the patient is now perfectly recovered.

When the arm was amputated, it was found that the vessels inserted into the scapula were torn through near their insertion; while other vessels, arising from this bone, were carried away with it. The artery carrying the vessels had remained in its natural situation, and was not at all injured by the division precisely at the insertion of the blood vessels.

At La Haye, *Trans. des Académies*, may be found an account of a little boy, who, while playing near the wheel of a mill, got his knee, forearm, and arm successively engaged in the machinery, and the third time he was torn away at the shoulder-joint, in consequence of the huge body not being able to pass in the division in which the arm was drawn. The bleeding was so liberal, that it was stopped with a little flax, and the boy very soon recovered.

In the fifth vol. of the *Archiv. Med. Chir.*, Gosselin gives an account of the history of a child three years and a half old, whose arm was torn off by the wheel of a mill. Mr. Gosselin, who saw the child about six hours after the accident, found it almost in a dying state, with cold extremities, rising internal action, and on the left side of the body convulsed. However, there was hardly any bleeding. The arm was broken above the elbow and a half above the elbow (the stump had a blooded appearance); all the soft parts were in

a depressed and lacerated state, and the forearm was not broken high as the articulation, which was not exposed. The skin and muscles were injured by a much greater extent, and in different directions. The remainder of the humerus was removed from the shoulder-joint by dissection, only as much skin as muscle being left as was sufficient to cover the wound. In two months the child was well.

In the *Ann. de Chir.*, de Chir. 1. 2, is an account of a leg being torn away at the knee-joint by a wheel. The patient was a boy, about nine or ten years of age. This accident, like the foregoing one, was accompanied with no hemorrhage. The lower portion of the os femoris, which was exposed, was repaired, together with such portion of the soft parts as was in a continued and lacerated state. The patient experienced a perfect recovery.

The preceding cases strikingly teach the common error which I have already made, in regard to the bleeding from wounds arising from arteries and lacerated wounds.

In these instances, the pain is often so intense, that the cause of the accident; it is generally very severe, when the wound is very extensive, and is not the other hand, when there has been a strong degree of constriction, as in cases of injury from the action of the pump, the patient seldom complains of pain at all.

When the lacerated artery has not been exposed above a certain degree, the pain is generally not that intense as the wound, as they cannot get into the deeper, lacerated one, and are one of the few exceptions. Constriction, nevertheless, is found, and the degree of constriction is regulated by the amount of the wound.—(See this work.)

When a still greater degree of violence has been done, and especially when a portion of a limb is torn off, the pain is not so intense, and the patient is not so much distressed. However, if the constriction is good, and the patient not so much distressed, it is not so good and well. But, in other instances, the pain is extremely distressing, for the pressure of the blood in the wounded part, which has cut off the flow of the blood, is continued, and the patient frequently complains of such pains as were not at all interrupted by the blood itself.

The identification arising directly from the rapid organization of parts is not what is the most striking circumstance. A still more important kind of identification is that which is apt to be mistaken for the most inflammation produced by the wound. The consequence of the rapid organization of the parts of the wound, when made not to be mistaken for the identification, with the view of identifying the identification before it has attained this high degree, and the various symptoms have commenced. In the absence, he should not be afraid of using the most liberal a little, if it should be deemed to do so. The edges of the wound should then be gently drawn towards each other, with a few strips of dressing, so as to lessen the extent of the exposed surface, so as to be more proper. Indeed, the plan of increasing the exposed surface of a compound wound with the view of inducing granulation is not altogether good, and their application creates a liberal degree of inflammation. The method is chiefly applicable, when there is a large flap of skin, which can be immediately brought over the wound. In other cases, it is best to leave the parts free, uncompressed, and exposed with the view of better planity, because, if more exposed, it would do harm, and could not possibly produce granulation of the parts. Under the most favorable circumstances, hardly any part of the wound can be kept so open by the first intention, the whole is the greater part of a well organized granulation, and the granulation of the edges.—The wound, and the granulation, were then to be formed, and the patient put to bed in a warm room. Finally, the patient was separated, the best application is a wet dressing, which should be put on cold, and it being at the first a source of blood.

Nothing, indeed, is so proper as the dressing, and the dressing is so important as the application, which is the most essential in preventing the granulation of the wound, which is the most dangerous consequence of the description of wounds.

No surgical writer, I think, has given more rational advice respecting treatment to wounds than that permitted by Paganini himself. In general, says he, the treatment of wounded wounds requires that they be simply and slightly, or chlorinated and warm, require the active employment of debilitating means in order to prevent inflammation. Cold water and ice, and general and topical bleeding, are the things usually resorted to with success. Yuccery means, unqualifiedly, and other operations are improper. And if their pernicious effects are not always very evident, it is only because the constant injury has been trifling, and in these nature perfectly easy of cure. In those cases, as well as in those of more serious and glandular, sometimes, death is given in preference to both operations. The internal remedies and vapors (says he) should also be adapted to the condition of the patient. A wound, but, at the end of its course, may come accompanied with a shock and fracture of the bone, while the lacerations have the appearance of being superficial. Such cases are often attended with death, the shock in the soft parts around the bone, which generally supervenes. This is an accident for which immediate amputation is mostly indispensable, even if the wound is not deep, but it may also be capable of preserving inflammation and curement, it is in the active debilitating plan of treatment, assisted with cold applications to the injured part. In such cases, the internal and external use of stimulants is approved of by many surgeons. But Amalut prefers considering the state of the injured limb and the when it is when affected with frost, and he thinks that the employment of stimulants will necessarily produce the same effect as caloric immediately applied to parts diseased with frost. On the contrary, from the active employment of fire and cold in these cases, and in continued injuries is great benefit to the greatest benefit derived.

Amalut observes that there will be need to support the patient. The operation of cold, he says, retards the course of the blood, which, meeting with only damaged vessels, increases the strangulation as it remains in place. By lowering the temperature of the part, cold applications induce distant the danger of inflammation and suppuration, at the same time they have the good effect of reducing the suppuration, which pain from the process that it would be very, in the continuation of blood and violence of the inflammation followed by such applications, and a lowering plan of treatment.

Why, says Amalut, should not this method, which is supposedly adequate to prevent the effects of extension of the brain after blow on the head, be for attaching means employed immediately to extractions and compression of the parts of the body?—Monsieur de Charpignon, (Paris, 1771.) Cold applications, however, in cases of wounded wounds are chiefly to be preferred for the first day or two, in order to check the course of inflammation and suppuration. After this period, I give a divided preference to an emollient liniment, which will be found the most easy during those passages by which the simple one dissolved, the surface of the wound covered, and the state of granulation established. When these changes have happened, the treatment may be directed to the same principles as others in general.—(See Case.)

Punctured Wounds.—A punctured wound signifies one made with a sharp-pointed instrument, the external surface of the injury being small and contracted, the wound being in a line perpendicular to its depth.

A wound produced by the point of a sword or bayonet affords an example of a punctured wound. Wounds of this description are in general, unfortunately more dangerous than any, notwithstanding the latter have the appearance of being by far the least serious. In these cases, the greatest degree of danger always arises from the injury and much violence, which the blow has suffered, in addition to their own division. Many of the dangerous consequences are also to be attributed to the considerable depth to which these wounds extend, whereby important parts and organs are frequently injured. Sometimes the treatment is rendered peculiar by the facility of inducing suppuration and suppuration, as, for instance, a puncture of the vagina which involves the rectum. Lastly, experience proves that punctured wounds and stabs are particularly liable to be followed by a great

deal of inflammation, fever, deep-seated abscesses, &c.

A strange notion seems to prevail, the feelings of many systematic writers, that all the danger and disagreeable consequences of punctured wounds depend entirely upon the narrowness of their orifices, so that suitable applications cannot be introduced to them but. Here, it is already recommended to draw the vessels of every side, with the view, as it generally added, of converting the accident into a simple incised wound. Some of these writers are advocates for making the dilution, with a cutting instrument, while others, with equal liberality, propose to enlarge the opening with tents.

Certain authors regard a punctured wound as a closed injury, and, in order to make the latter surfaces unite, they recommend causing a degree of inflammation in them, either by means of venous or injections.

In the earliest edition of *The First Lines of the Practice of Surgery*, I took particular pains to expose the folly and error which prevail in most writings on this point of practice. In the latest work I have remarked, that if the action were true, that an incised and punctured wound, such as the stab of a bayonet, could be actually changed into a wound pointing out of the skin, instead of an incision, by the mere enlargement of its orifices, the corresponding practice would equally be highly recommendable, however painful. But the fact is otherwise: the rough violence done to the fibres of the body by the *quantity* of stabs is also likely to be suddenly removed by an enlargement of the wound. Not only the distance to which a punctured wound frequently penetrates, and the number and nature of the parts lacerated by it, but all added by such a penetration. These which are the great causes of danger, and of the collection of matter that often takes place in the same under consideration, must exist, whether the mouth and canal of the wound be enlarged or not. The next step, however, we prefer it when there are foreign bodies to be removed, attempts to be opened, or space to be divided. To make partial incisions rather than they can remove, or even incisions and treated. They are sometimes rendered quite unnecessary, by the union of the wound throughout its whole extent without any suppuration at all.

Making a free incision in the early stage of these cases and usually seems a reasonable method of preventing the formation of abscesses, by preventing the collection of matter, and were it not an inevitable consequence of all punctured wounds, for which no incision had been planned at the moment of their occurrence, it would undoubtedly be explicable to some extent. But, however, as time passes away, it is only superficially plastic, and a small degree of infection, even discolors the wound of real solidity. Under what circumstances does it occur? As they are found only where there is some cause existing to prevent the healing of an abscess? This cause may either be the indirect way in which the abscess communicates with the external opening, so that the pus cannot readily escape; or it may be the presence of some foreign body or carious bone; or, finally, it may be an induration of the lower surface of the abscess to form granulations, arising from its long duration, but, however, by laying the abscess completely open to the influence of the air. That is becoming manifest, that the common explanation of punctured wounds is followed by vision only when the common opinion is to procure a free issue for the matter after its accumulation, or when he subjects to make any unnecessary incision. But as either the wound at first can only tend to enlarge the inflammation and render the suppuration more extensive, it might serve to be prejudicial in these cases, except for the direct object of giving freedom to matter already collected, and of being able to remove dangerous bodies properly lodged. I shall now state, repeat, that it is an erroneous idea to suppose the introduction of punctured wounds to prevent a cause of the last species, which they are often intended, that the treatment might eventually be able to be removed.

Recent punctured wounds have scarcely had the same plan of treatment applied to them as old and callosities. Scarce and dissolving injections, which in the latter cases, sometimes act beneficially, by exciting such inflammation as is productive of the effluvia

dies; but if any vein of considerable magnitude be hurt, they quickly design themselves to their labors, knowing that nothing can then be of service. Among the venous anastomoses they chiefly deposit, are serum, red, mamma, and, particularly, strong doses of venous, as will be presently noticed again.

If we put down of coagulation, insulate affected with rubber, the viper inflicts the worst poisoned wound ever met with in these islands. In fact, it is an animal that inserts into the part which it bites a poisonous capsule of exuding very active venomousness. The jaws of the viper are furnished with teeth, two of which in the upper jaw are very different from the rest. These, which are about three lines long, are covered, for about two-thirds of their length, with a transparent coat, or sheath, one of a curved shape, and articulated with the jaw-bone. When the animal is tranquil, and its mouth shut, they lie down with their points turned backwards; but they instantly project forwards when it is irritated and about to bite. In these points which are furnished by a very narrow flange, as their sheath slides, a little way from their point. The rest of these flaps is very hard and solid, and the canal is usually filled with a transparent, yellowish fluid, the poison of the viper.

This venomous fluid is supplied by two glands, or rather by two chambers of glands, one on each side of the head, placed on the front of the forehead, directly behind the eyelids, under the muscle which drives in the upper lip. These the animal cannot get withdrawing from view, and presenting the exterior of the head which they are destined to prepare. A little bag or vesicle, connected to the base of the first part of the appendage, as well as to the end of the second, covers also the point of the curved flaps, and serves as a reservoir for the venom.

The viper is chiefly found in hills, woods, and woody districts, and seldom is hit in many places. It is not its habits to attack man, or large animals, except when provoked. Its venom is easily applied for the destruction of smaller animals, such as mice, frogs, &c., which are usually swallowed whole, and to the digestion of which the venomous secretion is by some writers supposed to contribute. When, however, a viper is provoked, and upon being held up, or hurt, it immediately bites, and, while it only on account of the shape of the flaps, the wound might be attended with very trifling effects; but it is certain of being so, by reason of the species of inflammation which commences it, and of which the mechanism is as follows:

When a viper is about to bite, it opens its mouth very wide. The two curved flaps, which had previously lain flat in the cavity of the mandibles, are affected at their base, and project and become perpendicular to the lower jaw. When the bite taken place, the poison is propelled through the flaps by the contraction of the muscles and the closure of the mouth, and is injected into the wound with a force proportioned to the accidental quantity at the time, and the vigor of the animal.

The bite of a viper is quickly followed by severe effects, some of which are local and the others general, but it is with the former that the disorder invariably commences. At the instant of the bite, the bitten part is swelled with as little pain as when a blow is given over the whole flank, and even affects the system and internal organs. Soon afterwards, the wounded part swells and reddens. Sometimes the inflammation is confined to the circumference of the injury; but most frequently it spreads extensively, quickly affecting every part of the limb and even the trunk itself. A swollen limb is often discharged from the wound, around which phlegmons arise similar to those of a burn. After a short time, however, the pain abates considerably, the inflammatory tension changes into a density or induration softness; the part grows cool; and the skin exhibits large livid spots like those of gangrene. The general symptoms also come on with celerity: one patient is troubled with anxiety, prostration of strength, difficulty of breathing, and cold profuse sweats. Vomiting frequently occurs, and sometimes copious bloody evacuations from the bowels. These symptoms are almost constantly attended with a universal palloriness and extruding pus about the navel.

The effects occur in the same way in nearly all subjects, with some differences depending upon the par-

ticular sensibility and constitution of the patient; the degree low temperature of the atmosphere; the greater or less anger of the viper; the number of its bites; the size of the region itself; the depth to which the flaps have penetrated; and whether the bitten part happens to be one of great sensibility, or was injured at, or the time of the accident. In general, weak, constitutionally persons, of bad constitutions and loaded stomachs, suffer more suddenly and alarming consequences than strong, healthy subjects who view the danger without fear. Several have died, of course, more dangerous than a single one; and, lastly, it has been remarked, that the venom of the viper is more active in summer than the winter.

A year or two ago, however, the newspapers recorded the death of a servant, from the most violent inflammation of the poison to a scratch on his hand, as he was examining the limbs and venous system of a viper perfectly tamed in the winter season.

Severe, however, as the effects of the bite of a viper may be, they are far from being so poisonous as they are commonly supposed to be. Indeed, the viper rarely proves fatal to an adult, even when it is bitten by a viper in the middle of summer, the period when the animal is most active and venomous. Numerous to this common belief, however, are upon record. Thus, in the year 1746, a woman in France, aged sixty-two, was bitten, the flaps of a viper, and died in thirty-seven hours, notwithstanding she internal use of the liquor antivenereum, and the evacuation of the wound and suppuration, even of it with her hand. In this case, it is to be observed, that no other elapsed before any thing was done. — (*See Annuaire de la Société Médicale*, t. 1, p. 40, *des Paris*, 1820.)

Fontana, therefore, was not exactly correct in concluding, that the bite of an ordinary viper will not prove fatal to a full grown animal, nor even to a large dog, though it does so in smaller animals. Five hares from their strong and healthy, were not able to hold a dog's mouth shut for a moment; and as this dog was little more than a third part of the weight of an ordinary man, Fontana supposed that a single bite could never be fatal to an adult. He says, that he had seen a dozen cases himself, and had heard of fifty more, only two of which ended fatally. Concerning one of these cases he could get no information, the other patient perished of gangrene twenty days after the bite. The information about these days after the accident, the bitten place having been deeply scarified, almost has been as the viper was received. Fontana infers, that much of the poison, &c. is lost even upon the bite of a viper, is the more effect of time. "Upon a person being bit by a viper, the fear of its poisonous bite terrifies himself and the whole family. From the perception of the disease being mortal, and that not a moment is to be lost, they apply violent and harmful remedies. The fear increases the complaint. I have known a person that was imperceptibly bit in the back of the foot, and who, after seeing the blood, and observing a viper near him, suddenly started away; over, is particularly observed in a woman for upwards of an hour, until he was accidentally observed and reassured out of it by being suddenly drenched in cold water. We know that death itself may be brought on by the best affluence of the blood, without any internal disease. Why may not people who are bit from a viper be produced solely by fear, and who would not otherwise have died from any complaint produced by the viper?" Although it must be owned that Fontana has been again and again of opinion upon this subject, the above reasoning is hypothetical and incorrect. If it were to be proved, that some very mild, delicate, or nervous people die from fear alone, it would not be admitted, that the generality of people die by broken panic also from the violent effect of animal venom.

Whenever the patient dies, the capsule is always mentioned to the quantity of venom injected in the wound; the number of bites; their situation near important organs; and the nature of proper means of relief. In ordinary cases of a single bite upon the extremities, the patients would not well even without any assistance; but the symptoms would probably be more severe and the cure slower.

From some facts supplied by Sir Everard Home, and observations made on the operation of the poison of the snake-headed scorpion of St. Lucia, the robin of

Capitis, and the calvariaque, it appears, that "the effects of the bite of a venomous reptile according to the intensity of the poison. When the poison is very virulent, the local inflammation is so rapid and so violent, and its effects on the general system are so great, that death soon takes place. When the body is otherwise unprotected, the daily absorption of venous matter with it in the parts close to the bite, where the cellular membrane is completely destroyed, and the neighbouring vessels very considerably inflamed. When the poison takes longer to spread to the general system does not prove fatal. It keeps on a slight degree of absorption, and the part in the part takes in very slowly; in about half an hour, swelling takes place from an effusion of serum in the cellular membrane, which continues to increase, with greater or less rapidity, for about twelve hours, extending during that period over the neighbourhood of the bite. The blood seems to flow in the small vessels of the vascular parts; the skin over them becomes quite cold; the action of the heart is so weak that the pulse is scarcely perceptible, and the stomach is so irritable that nothing is retained by it. In about sixty hours, these symptoms go off; inflammation and suppuration take place in the injured parts; and when the abscess formed is very great, it proves fatal. When the bite has been in the finger, that part has usually healed. When death has taken place under such circumstances, the abdominal vessels and their glands have undergone no change whatever in the effects of the morbid poison, nor has any part lost its natural appearance, except those immediately contiguous with the abscess. In those patients who recover with difficulty from the bite, the symptoms produced by it go off more readily and more completely than those produced by a mortal poison, which has been received into the system."—*Sir R. Hardy, Case of a Man who died in consequence of the Bite of a Rattlesnake, in Phil. Trans. 1841.*

[There is scarcely to be found a more interesting case of the kind than that recorded by Sir Richard Brown, as quoted by our author, and the history of the case deserves to be read with all the care which Sir Richard has given to it. No other question than the intellectual power of the patient were materially affected. This is an unusual circumstance only in cases of poisoning from venoms and poisons. Sir Brown appears to have been the father in the case of a young man, Mr. A. of New-York, who was in 1811 seriously injured in the arm by a rattlesnake; that and been kept in confinement three years. The wound of the poison, according to Dr. Paracelsus, began to exert its effects in the formation of Suppurative Abscess, upon the first hour, and in local cancrum, such as went under the name, *St. Ignace's Abscess*. But in the case of A. the mind preserved its wonted functions throughout the whole disease. When the bite is inflicted in a large vein, its effects were to be local, permanent, and its duration more certain than under other circumstances.—*See Fagge's Med. Jurisprudence, New-York Med. and Phys. Journal, vol. V. No. 1.*

Nostrum remedies for the local action of the venom have almost entirely failed. According to certain writers, each of these remedies has effected wonderful cures; and yet, as Boyer well remarks, every one of them has been in its turn, relinquished for another, the sole recommendation of which has frequently consisted in its virulence. Any of these boasted specifics, though of opposite qualities, as it were, seemed to cure the patients, and the possibility of such a cure led him to try the next, until he was at length cured, when the patient, or when he administered it year after year, recovered perfectly after suffering a train of severe symptoms. But the reason of this pretended efficacy becomes obvious, when we know that the bite of a viper is of itself rarely mortal to the human subject, and that the severity of the symptoms materially depends upon the quantity of the venom in the wound.—*(Boyer, Traité des Maladies Chir. &c. t. 1, p. 428.)*

The treatment of the bite of a viper is divided into local and general system.

The local treatment has for its principal object the destruction of the venom, the prevention of its entrance into the vessels of the neighborhood of the wound.

Of destroying the wound, I shall only say that it

prevails on utility, if it is practised with care of drying each dressing is applied at very short intervals. For many know that the surface of the wound is not in this manner. Potent was an attempt to apply ligatures round the limb in order to arrest the progress of the venom into the circulation, and it thought that by such means much might be gained.—*See Second Essay, &c. &c. of system, &c.*

The only rational local treatment in terms of secondary mischief, is making incisions above the wound, to suppress the cellular membrane, and to bleed to the swelling, which only spreads in the parts under the skin, and swelling, for the parts already swelling, that the effect of the venom on the system be dissipated as soon as it is formed. In nature (he says) we employed in America, but with different view, &c. to prevent the poison being introduced into the system.—*Phil. Trans. for 1841, p. 1.* Actual incision, if accompanied by ligatures, should be regarded as not so much as that of the patient himself by the interruption of the circulation. With respect to the application of powerful means, the best of them from that adopted by the foregoing writer, as well be presently noticed.

Section of the wound has been proposed, and some have in be supported by those who express, as I shall presently explain in showing the rationality of section of Dr. Barry.

One of the most certain methods of removing the virus consists in the excision of the bitten part. The operation, however, would hardly be proper, were it not immediately after the injury, when such a dissection had taken place. It is known a person in which such patients would not stand, and even some surgeons might deem that procedure too late, in section in the late of the case of this country. But the benefit also be incrementally caused by the section of the parts. Excision, as Dr. Barry thinks, is only to be used in proportion to its extent. It is not beyond the point of the incision, save, for the skin, and the other parts of the body, which are being now exposed to the atmosphere, and the possibility of poison beyond the boundary of the wound, will pass with increased rapidity to the heart.—*(See Phil. Trans. for 1841, p. 123.)*

Another plan, more cautiously proposed, is that of destroying the venous part with some sort of local caustic. When this is done to use it is said that the poison will be prevented from flowing in further down the system. The caustic itself, it is supposed, may also have the effect of destroying the vessels itself, while they are in motion, and passing into the circulation, instead of being at rest, the neighbouring absorbent system. The venom, which Potbury proposed as a poison, but, as I have already remarked, every cause of suppuration will infinitely have the same effect, as a caustic, in the form of destroying the point of infection, &c. &c. of the venom. In France, liquid caustics are preferred, the fluid mixture of antimony, the acid of arsenic, or the sulphuric acid, being the most common is a dilution, and they have commonly smooth the bottom of the wound.—*(Phil. Trans. for 1841, p. 123.)* Either of these liquids may be applied by means of a slender pointed rod of wood, which is dipped in it, and then introduced into the wound made by the fangs of the viper. The plan is not to be withdrawn, but once, twice, and then again. If a drop of the caustic can be forced in touch the better. When the bite is superficial, and deep, the caustic cannot well be introduced more than a depth of the wound is somewhat satisfied with a finger. A little bit of fat may then be used to cover the above fluids, and be pressed deeply into the wound. The agent and potential caustic, this caustic will only succeed, when their action extends beyond the limits of the poison.

After the caustic has produced its effect, the best application is an emollient position.

It is not, however, every kind of a viper that requires local treatment, even of this degree of severity. When the wound is superficial, the skin is not much affected, the poison is considerably exhausted by its being previously killed, and the swelling is not dangerous; and the patient neither suffers from the effects of the poison, nor from the caustic.

applied; others, however, still, a fluid we must administer, such as the strongest astringent liquor, while others, on the contrary, tried every different kind of medicine. In short, there is hardly any account of medicine that has not been tried on a case in this disease; while at the same time it is known, that, under all the varieties of application, none of the patients died." Hence, Pereira concluded that none of the remedies had any effect in curing the disease.

Later observations, however, led to more and more, that a cure was to be known, which could exempt to persons considerable anxiety, and all the time of a very considerable kind of attack. From some facts recorded in Dr. Ross's History of Indian Diseases, on the authorities of Mr. Duffin and Mr. Rennie, it appears that the Tawjee (it, of which disease is the chief ingredient, is combined with considerable success in India after the loss of enormous perspiration. This information led Mr. Chevreign to propose the fair trial of arsenic.

Mr. Ireland, surgeon to the 60th regiment, had formerly treated Mr. Chevreign's numerous the trial of arsenic, and he was resolved to make the experiment whenever an opportunity offered. On his arrival to the island of St. Lucia, he was informed that an officer and several men belonging to the 60th regiment had died from the bites of serpents, supposed to be the various varieties of Laticia.

The reader will find some interesting account of the serpent here alluded to, in a tract which I have lately read, entitled *Monographie des Tergentophores des Antilles, ou Histoire Naturelle de la Laticia, de la Mamba, de la Vipere, de la Cobra, et de la Serpente de l'Inde*, Paris, 1830.

Mr. Ireland described that every thing had been tried by the attending medical men to no purpose, as all the patients had died, some in 24, and others in about twelve hours from their receiving the wound.

A man, however, soon came under Mr. Ireland's care, who, as nothing else had been done before seemed to have been of any service, he was determined to give arsenic a fair trial.

Jacobus, a soldier in the York light infantry regiment, was bitten in the left hand, and the middle finger was so much lacerated, that I found it necessary to amputate immediately at the joint with the rectus carpi bone.

Just half an hour after, another soldier had received the wound, and found him in a fatal, senseless state. The hand, arm, and breast of the soldier were much swelled, and of a dark purple and livid colour. He was vomiting, and expressed as if much distressed. Pulse quick and hard; he felt little or no pain during the operation.

The wound being dressed and the patient given to bed, I ordered a cathartic, (castor), and the following trochiscs to be taken immediately. R. Lapis, scrupulis ij. Trich. ros. et. l. ʒij. each, sig. 3 iij. which was added to four ounces of lemon juice, and as it produced a slight emetic effect, it was given in that state. This continued for the evening, and was repeated every half hour for four successive hours. In the night, the patient was somewhat relieved with some antispasmodics, and ordered with a balsam composed of Oil of Clove, ʒss. Liqueur anisees, ʒss. and Oil rose, ʒss. The cathartic effect was repeated twice, when the patient began to be purged, and the antispasmodic effect was more discovered. He felt some relief when treated, and from that time he gradually recovered his faculties; he took some refreshment, and had several hours sleep.

The next day he appeared very weak and fatigued; the inflammation and tumour were repeated. The swelling subsided gradually; the natural colour and feeling returned, and by proper dressings to the wound, and attention to the state of his bowels, he soon recovered and returned to his duty.

Mr. Ireland states about four other examples, in which arsenic was exhibited with similar success.

In several particular notes, the report was employed by Dr. Ireland was proposed according to Dr. Fother's description, which directs six grains of arsenic, and as many of the finest vegetable alkali as he dissolved in a small bowl, and the solution to be made an emulsion, so that two drachms contain one grain of arsenic in solution. (See Med. Clin. Trans. vol. 2, p. 300, &c.) Whichever may be the true medicinal treatment of poisoned wounds, the local

management of them on their first occurrence, according to the principles explained by Dr. Hall, are already evident in this article, which seems to be justified, as it is certainly more deserving of commendation, as it operates as a preventive of suppuration, which, and they have come on, sometimes prove fatal. It has been stated that it is too often proved.

A singular case of poisoned wound from the bite of a catoblepas occurred some years since, under the observation of Dr. S. T. Barnard, in Williamsburgh, Pennsylvania, and in some respects is perfectly singular.

A lady in the fourth or fifth month of her pregnancy was bitten by a catoblepas, but under the treatment resorted to at length recovered from the symptoms usually consequent upon such wounds. At the period of gestation, she was slightly distressed by a healthy-looking child; but subsequently on its being applied to the leg and arm, it was found that the wound had produced the most violent effects, and soon died. She then produced a puppy to relieve her limbs, with a few days of the same symptoms. A lamb was then sent, and it succeeded, her puppy, and three lambs shared the same fate. Another puppy was then produced, which suffered with its life, but exhibited no signs of the same wound had been fatal to its predecessor. The lady recovered all this time without any symptoms of disease, and had in rapid a recovery from pain, thus it is really singular.

The poison seems to have been caused by the poison of venereal; for the second girl attacked did not suffer much, and though she suffered a great deal, yet without fearful consequences, in some consequences escaped.

The discovery in which the action of poison is by human copulation is justified, in so far as it is proved when we consider that both of the most common hydrophobia may be produced by a human bite, and that the disease may sometimes be transmitted. According to M. Dumas, in 1827, in an village of Dec, thirty-two persons died, who have been known by mad dogs; and on the next day, hydrophobia occurred in several individuals within three days. (See Journal des Progrès, quoted in Med. et Med. and Surg. Journ. vol. 6.) The cause was not known, but hydrophobia is a disease which is common to the mind, person, foot, face, eyes, the throat, head, &c. Drs. Huxham and Francis explain the opportunity of transmitting a case of hydrophobia. A regular young man, and father of a family, (the father of the late of a child) died. He had been severely injured by his guardian's servant, he was severely affected; the wound of foot and arm, and in the evening, the wound of the foot was about to be broken open by an existing case of his complaint. The symptoms of hydrophobia throughout were similar to those which have been noticed by the bite of a mad dog. (See Med. and Surg. Journ. vol. 2.) A second case in the various means employed for the cure of hydrophobia by Dr. Meade, may be seen in the Med. and Surg. Journ. and through I hope no confusion is so remedy, I must refer to Dr. Meade's paper in the Medical Repository of New York, containing the report of the medical staff in such cases. (See latter Transactions on Hydrophobia.)—Gore.

Wound of the Throat.—The throat is a cavity in an irregular oval figure, bounded in front by the larynx, laterally by the ribs, posteriorly by the vertebrae of the neck, above by the maxilla, and below by the diaphragm, a very powerful muscle, which comes into of position between the cavity of the throat and the inferior abdomen.

The diaphragm is not stretched across to a direct direction from one side of the chest to the other, but on the contrary, descends inarch thereby to some part of the others. If the cavity of the chest be divided by a transverse section, about the middle of the sternum, the diaphragm appears, in appearance, to be very prominent and convex towards the chest, when it is fully distended, and its edges, towards the lower to which the muscle is attached. At the same time, and under elevated gas, it is fixed to the posterior convex surface, descending obliquely to the right and left, it is fixed on both sides to the seventh rib at the lower ribs, and lastly into the lower dorsal vertebrae. According to this description, it is evident that the diaphragm

of the thorax has much greater depth and capacity looking than in front, in circumstances which suggest ought to be well aware of, or the they will be liable to give most erroneous opinions concerning wounds of the chest. For instance, a practitioner deficient in anatomical knowledge might imagine, that a weapon pointed from above downwards into the front of the chest could never reach the lungs, after having penetrated the cavity of the abdomen. It is a fact, however, that no instrument could pass in this direction, even downwards below the highest part of the abdominal cavity, without entering the chest.

The whole cavity of the thorax is lined with a membrane named the *pneum*, which is very adherent to the chest, which lines the parietes of this cavity, and is the *diaphragm*. Each side of the thorax has a distinct pleura. The two membranes meet in the middle of the chest, and extend from the sternum to the vertebrae. In this manner, two cavities are formed, which are in contact with each other. By the two pleurae meeting and lying upon each other, a middle partition is formed, called the *mediastinum*. These two membranes are so situated as to be in contact with each other, the whole length of the sternum; but behind, where they approach the vertebrae, they separate from each other, so as to leave room for the *aorta*, *oesophagus*, &c. The heart, enclosed in the *pericardium*, occupies a considerable space on the left of the *mediastinum*, and all the rest of the chest is filled with the lungs, except behind, where the large blood-vessels, *aorta*, *oesophagus*, &c., and *oesophagus* are situated. In the perfectly healthy state, the lungs do not adhere to the pleura; but in the majority of subjects, at least in this climate, when they are examined after death, such adhesions are found to a greater or less degree. The thoracic cavity probably is not covered by any slight inflammation; and as the surface of the lungs is naturally covered by an air, in close contact with the pleura, and patients are frequently not supposed to have any thing wrong in the chest, this essential change being often accidentally discovered after death, is looked for something else, it may be concluded that it does not produce any serious effects.

The thorax is subject to all kinds of wounds; but their importance particularly depends on their depth. Those which do not reach beyond the integuments, do not suffer from serious wounds, and when properly treated are seldom followed by any bad consequences. On the contrary, those which penetrate the cavity of the chest, even by the slightest opening, may give rise to alarming symptoms. Lastly, wounds involving any of the thoracic viscera are always to be considered as placing the patient in a state of considerable danger.

First what has been said, it appears that wounds of the thorax are very properly divisible into three kinds: 1. Such as affect only the skin and muscles; 2. Such as enter the cavity of the chest, but injure none of the viscera; 3. Others which injure the lungs or some other viscera.

Superficial Wounds of the Thorax.—Immediately a weapon is called to a wound wound of the chest, the first duty should be to ascertain whether the weapon has penetrated the pleura or not. In order to do this judgment on this important subject, the following are recommended: 1. Placing the wounded person in the most painful position, as when he is inclined the wound, and then carefully examining, with the finger or probe, the direction and depth of the stab. 2. The symptoms, if positive, of the weapon, as in most cases each of it is entered with blood. 3. The lightness of fluid into the wound, and attention to whether it immediately increases or subsides in the part. 4. The colour and quantity of the blood discharged from the wound are to be noticed, and whether any is coughed up. 5. We are to ascertain whether air escapes from the wound in expiration, and whether there is any employment. 6. Lastly, the state of the pulse and breathing must be ascertained.

In wounds of the chest, however, surgeons should not be too cautious with their probes, merely for the sake of gratifying their curiosity, or attempting to be doing something. No judicious surgeon can doubt that authors have dwelt too much on the subject of probing wounds of the abdomen and thorax; for they would really lead their readers to believe, that the wound has been treated with the finger or probe so to vary between and over-treatment, surgeons are not qualified to

institute any mode of treatment. The only advantage of knowing that a wound penetrates the chest is, that the practitioner immediately feels himself justified in doing recourse to bleeding and other antiphlogistic means, with the view of preventing inflammation of the pleura and lungs, which affection, if not cured in time, often proves fatal. However, there can be little doubt, that if the nature and depth of the wound cannot be readily ascertained with the eye, the finger or a probe, or by the discharge of air or blood, it is much safer to live ignorant than to put him to useless pain with the probe, and waste opportunities of doing good which too frequently can never be recalled. In short, generally speaking, it is better and more advantageous for all patients, that some of them should lose blood, rather than that any of them should die in consequence of the evacuation being omitted or delayed.

Almost all writers, who have taken pains to direct how wounds of the thorax should be treated, conclude with remarking, that however advantageous a knowledge of the direction and depth of the wound may be, such hints have frequently been done by pushing the attempts to gain such information too far. It is, perhaps of greater importance to learn by some kind of estimation, the extent of a wound, which does not reach beyond the *mediastinum* or *intestines*, than to know whether the wound extends into the cavity of the chest. For even when the pleura is found to be divided, if the wound be covered with an *aspirator* or *aspirator*, the information is of no practical use, if we make it a custom to adopt, without the least delay, a strict antiphlogistic plan of treatment in all cases, in which there is any suspicion or chance of the path within the chest being increased and likely to inflame. Besides, frequently the symptoms are more urgent and alarming, than they could be, were only pain on the inside of the chest injured; and under such circumstances, it is needless that a probe should be necessary for determining that the wound extends into the chest.

With respect to the injection of lukewarm water, or any other fluid, and the circumstance of its respiration as a reflection of the wound being only superficial, the plan is more objectionable than the employment of a probe; for if the liquid be propelled with force, it may be injured into the pleural substance, and even to be passing through the track of the wound into the chest, while, in reality, not a drop does enter. Besides, it is a wretched proceeding to try to unite any quantity or kind of liquid whatever between the pleura and lungs, into a situation in which it must necessarily obstruct the important function of inspiration, and cause serious inconvenience.

When air issues from the wound in expiration, there is ground for suspecting that the lungs are wounded. But I believe that such signs at present this circumstance as an infallible criterion of the nature of the wound, labour under a mistake; for when there is simply an opening in the chest, without any injury of the lungs whatever, the same symptom may occur. The air which is discharged through the wound in expiration has previously entered the bag of the pleura through the same wound in inspiration. In order to remove all doubt, the patient may be requested to expire strongly at his ease, so as to know whether the air has accumulated in the chest. At the end of each expiration of this kind, care must be taken to bring the skin closely over the orifice of the wound, and to keep it thus applied during each following inspiration, for the purpose of preventing the entrance of air from without. In this way, if there is no wound of the lungs, all the air will soon be expelled; but if it still continues to be discharged in expiration, the lungs must be wounded.

Sometimes an inflammation swelling takes place round wounds of the thorax, in consequence of a quantity of air diffusing lower in the cellular substance. In wounds which are slight and single this swelling is very uncommon, but in cases of narrow oblique stabs, and where the lungs are wounded by the points of broken ribs, it is by no means uncommon. (See *Emphysema*.) When a considerable quantity of blood flows from the wound, there is reason for conjecturing not only that the weapon has penetrated the cavity of the thorax, but that some of the thoracic viscera are injured. Excepting the *aorta*, which runs along the edge of the lower ribs, and the trunks of the

When the nose is pushed pointed toward the floor of the divided parts are too supply on, they are also considerably stretched, heated, and when very irritated, bleeding profusely. They will not smother of being excited so readily as the sides of a throat, and, hence, require a sharp stimulant. However, the possibility of getting the opposite sides of punctured wounds must depend very much on the character of the weapons, and the calmness, firmness, and absolute truth which it has driven into the part. A quick with a needle is a guaranteed remedy on the first made by surprise, with their failure; yet these injuries do not frequently bring on inflammation and abscesses, as other wounds frequently do, which are inflicted with bayonets and knives.

Little is known of the man who received the thrust of a bayonet, which fell into the sea, and swayed, carrying one side of the line, to the point that the sailors looked with the greatest advantage at his father's.

Instead of laying open the whole track of such a wound, with a knife, as is unfortunately recommended in many of the books on surgery; or instead of drawing a suture through the whole course, or of 40 stitching over the part a hard irritating cast; the practitioner should take temporary closure there may be of saving the wound without suppuration. For this purpose, he should remember that the great danger of violence done to the parts is placed there is the reason why they are so easy to inflame and suppurate. Hence, the expected inflammation is to be concentrated in delivery first instance; and immediately the wound is closed, the patient should be bled 100, and afterwards take purgative medicines. With respect to the dressing, the orifice of the wound may be lightly closed with sticking plaster, or covered with a cold superficial application. Once and several times the wound may be kept open, kept constantly wet with cool water or the liquor plumbi acetate distill. As, however, many patients have a strong dislike to any application to very wounds upon their bodies, it is often necessary to dispense with this method. The dressing can so be retained with a roller; but it is not to be again necessary to have likely to do water than good. Thus, the inflammation of the wound will be subdued; the extravasation of blood preserving the chance of union by the first coagulum when; and all partial operations avoided. And nothing is more certain than the fact that if an abscess opens, it is rarely cured, many times just without suppuration, or may very soon suppurate, when no hope could be entertained of these things, or under other treatment. But if suppuration should happen, and a discharge of matter take place, would the patient suffer more or longer than if the wound by having a proper dressing, and of just sufficient size, were made into the abscess than a simple plaster, that it be not subjected to have the formidable operation of laying open the whole extent of a such perforation in the first instance. In short, will be sufficient to avoid, be laid off just in getting well, or have to give rise into the danger? With still more advantage, by with the taking a regular course in which methods all these causes the wound would not avoid by what it should be the best treatment, and to try, without any suppuration. I need not enlarge upon this subject, but refer the reader to what has been said in the preceding remarks on the subject of Pustular Plague, and in the treatment of abscesses, to the above suppuration. Goodwin would hereby asking the purpose of the chest are to be removed according to principles already explained—(see General Remarks.)

Of *Hawaii protesting the closing of the Thorpe*.—
 "Favorable measures" for that big *Hawaii* corporation,
 and thus the famous situation of the postmaster. I
 want not only to see, but also to see the story of
 Thorpe, but without losing the value.

Another highly sensitive and important study by the FBI in 1981, titled "Investigation and Control of the Gangs in Chicago," was the first to attempt to identify the structure of the gangs in Chicago and to develop a classification system for the gangs. The study found that the gangs in Chicago were organized into a hierarchy, with the most powerful gangs at the top and the least powerful at the bottom. The study also found that the gangs in Chicago were involved in a variety of criminal activities, including drug trafficking, prostitution, and gambling.

of the larynx. If one of the intercostal arteries be wounded, and the external surface be very painful, the blood, furnished by this vessel, may pass into the chest, and immediately produce asphyxia of the breathing, and other symptoms of pressure on the lungs. Of what is to be done in this case, I shall presently treat.

[illegible]

Perforating wounds of the chest are accompanied with signs of the following circumstances: 1. Foreign bodies. 2. Injury of one of the intercostal arteries. 3. Penetration of a portion of the lungs. 4. Emphysema. 5. Reabsorption of blood in the thorax.

2. About 1/3 these wounds occurred just and directly at localities. Many of them are also followed by an equally serious swelling around the wound; the patient frequently swells all about; and after having laid for some time a small, constrained, irregular patch, with a small macerated and red center, he is the often victim with severe edema, sometimes, the effect of inflammation of the lungs and pneumonia the cause. These symptoms almost invariably follow the bleeding, a very low rigors, a pulse like tremulous, the use of leeches, or support, and the other treatment of aneurism. If much blood is poured out, recovery longer than a few days without treatment, unless before it that there is ground for supposing that they depend upon the position of some foreign body. However, it may be feared whether Soliman's advice, to continually rub with such a soft, warm, and moist substance, is proper, after these hemorrhages. For my own part, I cannot think the pyrexia also notified by an acute aneurism, and even were it so, on the principle above it will be removable.—*See Medice Quæstio, p. 20.*

Butcher inquired of the men following cases, for the purpose of showing what really be attempted in these cases. "A man, twenty-seven years of age, was struck very suddenly, and a knife on the outer part of the fourth rib rose. Simple dressings were applied for the first four days; but a considerable swelling and splitting of blood staining, Mr. Gillet was consulted, who found that the symptoms depended on the presence of a piece of the knife, which had passed the rib and was protruding some six inches from it. The title of the foreign body was on the inside of the rib, and it was so fixed in the bone, that it could neither be connected with any kind of forceps nor even moved in the bone with a bone saw, Mr. A. Although the only standard seemed to be that of saving or removing a portion of the rib, Gillet conceived, that in at least, might be made to extract the foreign body by pulling it from within outward. For this purpose, having put a good thick cloth under finger, he introduced it into the cavity of the thorax, and thus succeeded in pushing up the piece of the knife.

A speech of the house was intended, but it was too firmly connected with the rest of the visit to admit of being emphatically taken off. General was allowed enough to surround the whole with an artificial guard with a bayonet. This is a serious proceeding, as the French were then engaged, but only the examination of all the final operations, but a speedy recovery. — (See Dr. Page's *Nile to the Third Air Operations in Egypt*.)

A reflector was shot in the left side of the chest. The bullet penetrated between the lower end of cartilage of the seventh rib (11 ribs), and came out in the situation of the upper end of the same bone, which was broken in two places. The greater part of the first lobe of lung was destroyed. Immense blood clots which filled the cavity, to take away several volumes of blood, and contained thin needles. Freshly granular fat.

When the wound corresponding to the intercostal artery was sufficiently exposed in the transverse direction, the narrow, distal end of the instrument was introduced, that the lower edge of the rib might be placed in the convexity of the curve, which the compressor acted on the edge of the bone, and, of course, on the artery. The rest of the instrument applied itself in the side of the thorax, in which situation it was retained. When the wound was not deep enough, a sufficient isolation of it was that made for the introduction of the instrument.

Quercy employed a piece of ivory, which he covered with lint, &c. and introduced it into the chest. The instrument was then, for a few minutes, retained externally by means of a thread, and then the necessary compression was produced.

Quercy's plan is somewhat like that favoured by Jany, but he has introduced the compressor entirely into the thorax, together with the ligature, which was the basis of it, and he has to have drawn the compressor from within upwards, he was probably intended, a very large wound would have been indispensable. This was also one of the many strong objections to Jany's instrument, which, in fact, could only be employed when there was a free and ample opening.

Billroth, seeing the inefficiency of all the compressing means used before his time, and such compressors, invented an instrument, which he only calculated for making private pressure, and following the motion of the chest without interfering the escape of extravasated blood. The machine is represented as described in *U. of Mass. v. 1, vol. 41, Ch. 40*. It is composed of two plates, which are added, and capable of being brought towards each other by means of a screw. This instrument, as Billroth observes, may indeed answer; but it is complicated and awkward, and its utility is founded on the supposition of the wound being larger than wounds are which are made with common weapons.

Justly seems to any unnecessary multiplication of medical instruments, modern practitioners regard all particular contrivances for stopping haemorrhage from the intercostal arteries. Indeed, as the archipel is very rare, it is probable, that the best instrument possible were devised it would hardly ever be at hand when required.

A common kind of flat (says Billroth), directed to a strong ligature, and introduced between the two ribs, or even quite into the chest, and then drawn back within towards the Quercy's compressor, would fulfil every desirable purpose. The external wound should then be covered with simple dressings, and a bandage applied round the body. The patient should be freely and copiously bled, and treated on the most rigorous antiphlogistic plan.

Professor Acland joins all the best modern surgeons in recommending the introduction of the preceding compressors and various substances into the chest, in order to stop haemorrhage from the intercostal artery. All these methods, he remarks, are calculated to excite a dangerous degree of inflammation in the chest. Hence, he prefers simply cutting the artery across, so as to show it to retract, and, if this plan fail, he recommends the wound to be closed. Should the blood find passage into the chest, it is true the compression would be useless, but not fatal; and if the symptoms require it, the operation of resection may afterwards be done. A small quantity of dried blood, however, may be absorbed, and no such complaint is dangerous. — *Manual of Chirurgie*, p. 26, 30.

Dr. Wilson observes, that whenever the thorax has been opened for an internal intercostal artery, the practice should be adopted. He states, that when he reported in which the vessel was thus secured, but that he has never seen the method adopted himself. "The fact," he says, "is, we but the vessel and the patient in finding the source of the haemorrhage, and here probability is not only means. In some very slight cases, I have used the compressed compressors in the thorax; but if the bleeding is excessive, seeing that the fibres of an artery, referred to often as arteries may require, and pressure direct upon a compressor placed along the course of the vessel, or as depend on temporary compression, which is of any avail?" — *Medical Surgery*, vol. 3, p. 275.

2. The protrusion of a portion of the lungs, in con-

sequence of wounds penetrating the chest, is a very unusual case; but there are some instances recorded by writers, and one time I attended myself after the battle of Waterloo. Schenkling relates an example taken from Robinson. The latter was called to a man who had been wounded in the thorax six days before. A portion of the lung protruded, in a state of excitation. Robinson extracted it, and the patient soon recovered.

Taylor also reported a similar fact. A man received an extensive wound just below the last rib. His external gas disposition, however, led him to neglect the injury; and on the third day, a piece of the lungs, three inches in length, protruded. The patient went to Amsterdam, whence he was taken two days' journey, for the purpose of receiving succour in one of the hospitals there. The protruded piece of lung, which was avulsed, was dried, and set off with saltpetre. It weighed three ounces. The wound healed in a fortnight, and the patient experienced no complaint afterwards, except a slight cough, with which he was occasionally troubled. He survived the accident six years, leading a wandering, drunken life. After death, nothing particular was observed in the thorax, except that the lungs had become adherent to the pleura, at the situation of the wound. Billroth relates another case. A man was wounded with a knife between the fifth and sixth ribs, near the sternum. As a piece of lung protruded at the opening and was of a dark colour, it was extracted with the actual cautery. The wound was then closed, and the ribs kept apart with a wooden wedge, under which was the portion of lung left by the opening struck within the chest. The patient was soon completely well.

A fourth example of a protrusion of a piece of lung through a wound in the thorax, is among the cases recorded by Baylis. The extent of a swelling was wounded in the anterior and inferior part of the chest, and was apparently, attended by a rupture, when indeed the protruded piece of lung for a portion of column, and applied a tight ligature round it. Baylis, who was consulted, soon detected the mistake which had been made, but he desisted his opinion that the wound would heal very well, as soon as the tied piece of lung was detached. The event justified his prognosis, and the patient recovered.

When the protruded portion of lung is small, the redundant ought to be made without the least delay. It should be done on the same principle as those on which protruded pieces of intestine, or omentum, are retained—*vide* *History of the Abdomen*. A recurrence of the accident is to be prevented by closing the wound, and placing a compress over it. But when the piece of lung is already in a mortified state in consequence of the constriction which it has suffered, or when its large size prevents reduction, Sabatier is of opinion that the only resource is to cut off the part, after applying a figure round its base. If the latter step were not taken, a dangerous haemorrhage might follow, or even an extravasation in the thorax. — *Medical Operations*, tom. 2, p. 204. However, the practice recommended by Sabatier appears questionable in the instance of mortification, because the dead part will naturally be thrown off by a spontaneous process; and when the wound is too small to allow the part to be retained, its resection might be more advisable than the removal of a considerable portion, or even any of the lung.

After the battle of Waterloo, I had a patient with a penetration of a piece of lung, to five inches in length. The part was much burned, and could not be easily reduced. I therefore applied a ligature round its base, and cut it off. Previously, however, I made an incision in it, in order to ascertain whether it would bleed freely, which being the case, induced me to use a ligature. I was afterwards informed by my friend, Mr. Collet, that the man died.

3. Empyema is another symptom with which penetrating wounds of the chest are frequently complicated, especially when they are small and indirect. When such wounds are small, and not directed to their source, when their track is undisturbed by other things, by change in the situation of the patient, the swelling of the parts, state of blood, or any numerous obstructions, we may mistake them for the cellular substance, so as to cause a great deal of mischief and dis-

however, the patient, in making an effort to expire, emitted the *stridor*, the air exhaled in the lungs of the wound was only in proportion to the amount of air and vessels of the lungs, on the same side as the wound, so as to distend them, and even cause them protrude in the wound.

Dr. Halliday remarks, that such a protrusion often happens when wounds are made in dogs, and has been erroneously noticed in an argument against the escape of the lungs when an opening is made into the chest of the human subject.—(See *Obs.* on *Emphysema*, by Dr. J. Halliday, 1855.)

For information concerning the treatment of this affluence, see *Emphysema*.

I have already noticed, that wounds of the thorax may injure one of the vascular arteries, and when the blood cannot flow away it may be extravasated in the chest. This extravasation may delay the escape of the pulmonary vessels, those of the lungs, or of the heart itself. And here I may take the opportunity of remarking, that extraneous wounds of the lungs do not prove immediately fatal. A vessel, in which a *bullet* passed through the lower, lower, diaphragm, part of the lungs, and the right ventricle of the heart, and yet the patient lived nine hours after the nature of the injury, is recorded by Dr. Richardson.—(See *Not. Morgagni and Richardson*, *Lancet*, 1789; also a case by Chesnut, in *Journal de Med.* 1812, t. 2.) In almost all cases, however, such injuries prove instantly fatal; and the same remark will extend to cases of hemorrhage from vessels above a certain size, but in these they are less considerable, the patient may live for a greater or less time, and before the aid of surgery.

[Though wounds of the heart are deemed extremely fatal, they do not always immediately prove so. Our medical records contain various cases in proof of this, very recently a case of murder came before the Criminal Court of New-York, in which the medical witnesses in behalf of the people advised, that the deceased, as proved upon the extramurder of one body, had received the fatal wound in the left ventricle of the heart; yet the sufferer survived nearly three quarters of an hour after the occurrence.—*ibid.*]

The following are the symptoms which denote an extravasation of blood in the thorax. The person feels great oppression, and soon complains as will not let him lie in any position. Unless his head has been very much lowered, in which position the diaphragm is relaxed, and not so much distended by the weight of the extravasated fluid, the first point of difficulty is standing or sitting up. When the rigidity is less, the patient can be with tolerable ease on his back; he is also not averse to lying on the side on which the wound is directed; but he cannot place himself on the opposite side without feeling very acute pain in the direction of the extravasation.

His respiration is short, frequent, and interrupted by sighs; his voice is hoarse; a colorless pale skin spreads over his countenance; his extremities become cold; a violent perspiration covers his neck and temples; his heart ceases; his pulse becomes weak; and if, as most frequently happens, the lungs are wounded, he coughs up frothy blood, and air issues from the wound.

Though one might suppose the above state of symptoms always attended as a considerable effusion of blood in the thorax, this is not the case. Wounded persons have been known to die of such an extravasation when symptoms were scarcely seen, and who did not complain of difficulty some hours before in any position that they assumed. Scudder says, that several times of late he has found bodies in the chest discovered. These wounded persons show when confined some of the symptoms attributable to extravasation of blood in the thorax, have been unable to sit up, vomit, have great oppression of a purple color, attended by a violent and superior pain of the chest, about two inches of the sternum, the ribs stiff, difficulty of breathing, and have been seen to expire, and as the symptoms were supposed to exist, not many were thinking of making an incision for its evacuation. A patient was one evening present, exhibiting rather the last of Emphysema, and last of emphysema, made him almost insensible. He became more composed by treatment, and the application of leeches, though at a distance of some of the wound.

However, even the assumption of the above symptoms did not direct Parr. Having been impeded to

point of an operation which was about to be done on a wounded man, about whose aspect, prostration, and, and numerous other vessels, a promiscuous emphysema was existing and taken place; whose respiration was painful and difficult; and who spit up frothy blood. Parr gave it as his opinion, that it was unnecessary to make an opening into the chest. He thought it would be sufficient to enlarge the wound, which was at a little distance from the sternum, near the edge of the fifth rib, and so as to give vent to the effluence of air. This advice was followed, the emphysema soon subsided, and the patient recovered.

The malignant nature of the symptoms of extraneous effusion of blood in the thorax, has induced physicians to pay the most scrupulous attention to every circumstance attended on these cases. In several instances, Valentin remarked, that an erythema occurred in the angle of the ribs, and had spread towards the heart. The erythema is described as being of a clear purple color, like the spots which sometimes form on the abdomen a little while after death. In a case, in which each of the symptoms of extravasation were combined with the above sort of erythema, Valentin advised a counter-opening to be made. The advice was executed and the patient soon afterwards died; more than six pints of blood were found extravasated in the thorax.

Another instance, that we cannot too highly apply the aid of these practitioners who understand the danger of the chest which still prevails in several parts of surgery. At the same time, be it said, that all who are interested in the improvement of the science should endeavor to ascertain the truth of any case about which we are offered. Hence, he deemed it proper to visit a case which was communicated to him by M. Saucerotte (the father), an excellent military surgeon, and which shows, that the erythema described by Valentin is, at least, not invariably attendant on extravasation of blood in the chest. A light housewife, who had received a thrust with a cane in the right side of the thorax, above the border of the pericardial sac, appeared to be going on very well for the first few days after the accident. On the fifth he complained of difficulty of breathing, weakness, and an inability of lying on the left side, without aggravating his complaints. He complained of a great sort of pain in the region of the liver, and at the top of the shoulder. His pulse was small and compressed, and rather hard than weak. The right side of the chest seemed larger than the left. On the eighth and ninth days the symptoms became more urgent, and the patient found no ease except in leaning on his right side, and supporting himself on a chair placed across his bed. The normalization of symptoms indicated an extravasation of blood in the right cavity of the thorax; but as the erythema which Valentin has described, was not apparent, such was entertained about the real nature of the case. When a counter-opening was made on the dead body, a pint of purplish blood flowed out.

When the symptoms first appeared, that an extravasation of blood in the thorax had really occurred, and the symptoms are very slight, the discharge of the confused fluid appears to provide benefit. However, before the operation is done, the greatest care of the pulse, the state of warmth in the extremities, and the cessation of great distress, ought to denote, that the hemorrhage is longer continues from the vessels; for, if this be not the case, a fresh quantity of blood soon comes extravasated again, and the patient die exhausted.

Another reason for methods of discharging blood from the thorax, viz. 1st, By placing the patient in a posture which favors the escape of the blood. 2dly, By introducing a syringe for the purpose of sucking it out, or a new channel, through which it is to flow; 3dly, By opening the wound, 4thly, By employing injectors; 5thly, By making an opening in a depending part of the thorax.

1. Blood cannot be removed from within placing the patient in a posture which is favorable to the escape of the extravasated blood, except when the wound is situated far in some part of the chest, and is large and direct in its course. Parr successfully adopted this method in the case of a soldier, who was wounded in three places with a sword, one of the wounds, which entered the chest, being situated under the right nipple. The man was first drawn by a surgeon, who understood anatomy. The patient was soon afterwards

attacked with considerable difficulty of breathing, fever, vomiting, spitting of blood, and white pain in the side. Pure, white was evacuated the next day, suspected that an extravasation had happened; immediately he cut out the sanguis, and placed the patient in a position in which his feet were much more raised than his head. Pure also accompanied him to hold his breath, and then introduced his finger into the wound, in order to make away some clots of blood which appeared as in others. By these steps the discharge of warm or cold masses of fibril, coagulated blood was effected.

3. The idea of drawing out of the thorax extravasated blood with a syringe, is rather ancient. The pipes of all syringes for this purpose should have bleed ends, but they injure the lungs. New tubes, constructed after the manner of the French syringe, have been frequently employed. Success relates a case, in which an incision of the latter sort was successfully employed. No syringe or any means with the mouth was requisite; it was found necessary merely to introduce the tube, and then withdraw the piston.

Lamotte used only a simple canula, which he introduced into the centre of the extravasation. Then having placed the patient as usual he proceeded to be the most favorable position, and requested him to hold his breath, he drew off the collection of fibril. His cases, numbered 120, 217, 218, show the success which attended this method. Although it might also have answered very well in case 214, Lamotte saw that the high situation of the wound would not have allowed all the blood to be discharged, and therefore he made a counter-opening. Thus the thorax was completely emptied, and a recovery ensued. When a canula is employed, authors recommend it to be introduced every day, till the last symptoms cease and no more fluid escapes through the cavity of the instrument. After having given vent to blood, it allows a bloody serum fluid to escape, and at a later period pus, which becomes a thicker and thicker substance the more the patient is in a recovery.

2. The cases in which a wound, complicated with an extravasation in the pleura, should be drained, are those in which the situation of the opening is favorable to the escape of the blood. The operation is performed with a curved stilet and a diatherme. The integuments and external muscles are to be divided in a perpendicular direction, and the intercostal muscles in a line parallel to the ribs. Care is also to be taken not to cut the vein the lower edge of the upper rib, and the intercostal artery be wounded. Details practiced was a soldier who was wounded at Bellet, in 1780, with a sword. Below the right nipple, whereby a direct opening was made into the pleura. When the extravasated fluid had been let out, blood ran into the patient into the wounded side during the night, and in proportion as the blood continued to be thus evacuated the breathing became free from oppression.

4. The methods above explained may be used when the blood retains its natural color of fluidity; but when it is coagulated, as often happens, they can be of no avail. In this circumstance, most authors direct a proper opening to be made, and tepid water then to be poured into the chest, with the view of loosening any clots, and the quantity and washing them out of the wound. The French writers, even the authors cited (Sabatier), most absolutely recommend the injection of various diluted, rubefacient decoctions, and of solutions of blood of mice, sheep, wolf, &c. What also these authors are witnesses of the great tendency to inflammation of the lungs and pleura, of which kind they can expect from such applications, is difficult to conceive. I am fully convinced, that the best means to be used in such cases, would be assisted of other such means.

5. When the wound is narrow, and situated at the upper part of the chest, the uppermost blood must be discharged, unless a counter-opening be made at the lower part of its cavity. The best place for making the opening, and the proper manner of executing the operation, are described under the head of *Pneumothorax*. As soon as the opening has been made, the blood flows out. Its discharge is then to be promoted by such a position as will render the opening depending.

The old surgeons, who had much more fear than the moderns of letting the opening heal, as a means employed to prevent the purpose of preventing the

exit, still at danger of another collection of blood or matter seemed to be used. However, as it does seem that an opening to be made in the pleura and lungs, beside the escape of which no fluid is contained in the chest, and which great arteries, veins, and every extrusion from the ribs, may be now reintegrated.

As large veins had the effect of hindering the escape of blood, matter from the cavity of the chest, some of the old French surgeons attempted a kind of work, but in the present state of surgery, I do not consider that it would be of all utility to make one a consequence of these contrivances. It may seem to cure respiration by keeping the opening from closing, their cause by a better thing for the purpose than a silver canula, with a view to keep it from slipping out the thorax, and two little rings or buttons, it is a contrivance with a shield. This shield may not close deeply enough to leave its inner orifice so nearly as very little further towards than the pleura cavity, so that it may not irritate the lungs.

When the patient has been drawn, he is to be laid in bed, with his head and chest somewhat elevated, and his limbs bent, in which position the breathing will be least oppressed. It is usual to recommend him to lie, as much as possible, on the side where the operation has been done. He is to keep himself as quiet a condition as he can. He is to get up very late, and, if his strength allows, he is to be tied from the arm, and this evacuation was to be repeated, with other sanguiferous means, when an urgency of the liver and inflammatory symptoms indicate, and the strength allows. Finding that to be too, he also constructing inflammation in the chest, which was principal source of danger, and in passing the force of the circulation in the thoracic vessels, and thus diminishing the tendency to blood coagulation.

The old practice of keeping wounds in the chest open is now nearly exploded, but if it was to be applicable, particular caution must be used not to cut veins and pleura of the dressings given into the cavity of the pleura. The case speaks of a French physician who had been under a crushing stress of matter of a wound in the thorax, and who coughed up, at months afterward, a large clot. A similar case is recorded by Richman. A man was stabbed in the side of the chest near the axilla, between his axilla and third rib. For a fortnight a great deal of blood was discharged both from the wound and the lungs. The wound healed; but the patient continued to be afflicted with considerable difficulty of breathing, an incessant cough, and to spit up a great deal of mucus. Three months afterward he coughed up one more which had slipped into the cavity of the pleura.

A violation of the antiphlogistic regimen must be made with very great circumspection. The antiphlogistic, making too frequently, and too soon, air compressions which may induce a pneumonia, hemorrhage and extravasation. Venousness is the chiefest of the others happen a foreign body in the wound, and eleven days after the operation for pneumonia. A soldier, who had been under in the chest with a wound above the right nipple, was attacked with fever, difficulty of breathing, weakness, and acute pain in the bottom of the chest. This syndrome induced Vesalius to order, that an operation had taken place; but he was afraid of making an opening in the chest, he fear the blood might still continue from the wounded vessels. However, in the patient remained in the same state the second day after the receipt of the wounds, and he could not breathe enough. Vesalius understood the operation, in which a considerable quantity of extravasated blood was discharged. The patient with pure blood at the instant. The receipt of blood continued for 48 hours, after which a favorable expectation took place in all the above wounds, and the case was cured and well. But the patient having repeated his wound and taken on with food, the symptoms of pneumonia ensued his death. Lamotte saw a person who had been under a crushing stress of matter of a wound in the thorax, and who coughed up a great deal of blood. He was under a crushing stress of matter of a wound in the thorax, and who coughed up a great deal of blood.

When the edges of a penetrating wound of the chest are to be brought together, writers say, that the first thing should be required to make a strong ligature

with the wound closed, and then a firm, strong expansion with it open, and so on, till as much of the air is discharged from the thorax as possible, and then the wound is to be accurately closed with wadding plaster. From what has been observed, however, in the article Emphysema, it will appear that when there is a slight opening into the thorax, that to admit the external air, the lungs are not so inflated, and remain so till the wound is healed and the air absorbed. When one of these wounds is treated, a collapsed state is induced, the best position in which it can possibly be for a certain time, and so, till the breach of continuity is repaired. Injuries by sucking the lung exposed by crushing the air from the cavity of the pleura may be attended in a paper, but, I apprehend, they will never be of real use in practice.

Purule sometimes continued a long while after wounds of the thorax. I never treated an instance in which there was a fistulous opening, out of which the so-called crab sufficient force to blow out a candle. The patient lived a long while in this state without suffering any particular inconvenience.

Another occasional consequence of a wound of the chest is a hernia of the lungs, the affection of which I believe met with its origin. A soldier, thirty years of age, was wounded with a bayonet in the right side of the chest, between the axillary part of the fifth and sixth ribs. The wound healed; but as the intercostal muscles had been divided to a great extent, and could not be approximated with precision, an empty space was left under the integuments, which allowed a piece of the lungs, as large as a walnut, to protrude between the ribs. The protruding enlarged in the time of inspiration, and grew smaller when expiration took place, occasioning every a night pain without any oppression in the chest.

Though no pains has been written on the subject of discharging blood from the chest in cases of extravasation within the cavity, the operation is very rare. During the last thirty years, I have never heard of its being done by any of the surgeons in London. In military surgery, however, the practice is occasionally resorted to—*Larrey, Mém. de Chir. Mil. t. 2, p. 125, 601*. No doubt, the true reason of the operation being uncommon is the obscurity in the diagnosis, the symptoms being all of an empirical nature. Even Larrey, generally so partial to operations, recommends the immediate closure of all wounds of the chest, excepting such as are complicated with injury of the intercostal artery, because (says he), unless very considerable vessels of the lungs are injured in which case nothing can be of any use, either no extravasation, or only a trivial one happens, which, under the employment of proper antiseptic treatment, may be dispersed by absorption.—(*l. c.* 127.) Regarding the general propriety of moving air wounds of the chest, I entirely concur with Larrey, Politien, Bayle, and Quercetanus.

—*The Military Surgeon, &c. p. 373.*
—*Comité Médical, De la Médecine Opératoire, &c. 2. Jure de Méd. Militaire, 720000.* —*Schmucker, Wundheilmittel, 2 & Berlin, 1773—1780.* —*J. Bell, on the Nature and Cure of Wounds, &c. 2. D. J. Larrey, Mém. de Chir. Militaire, nos. Paris 1802—1807, in numerous places.* —*John Hunter, Principles of Military Surgery, ed. 2. New Edinb. 1821.* —*Wm. Hunter, on a wound of a Chest of Newbury after an extraordinary accident, Jan. 1818. The injury here referred to is one of the most extraordinary on record; the shaft of the pig having been driven into the greatest distance between the sternum and lungs.* —*Mr. A. Halliday, in Edinb. Med. and Surg. Journ. vol. 11, p. 340; a rib having first a gunshot injury, in which a great part of the shoulder and scapula were, and the lungs and posterior cavity were exposed to the naked thorax of this case I saw four weeks since, having been at the field hospital, when the soldier arrived from the theatre, near Antwerp.*

Pressure of the Abdomen.—How one of the chief causes of danger is the tendency of the peritoneum to inflate. Every penetrating wound of the body is apt to excite this inflammation, which for some extends itself over all the viscera, and terminates in the death of the patient.

There are (says Mr. John Bell) a thousand instances in which the delivery of the peritoneum may be admitted. The wound of the small vessel and the side

of the chest, explain to us how quickly the peritoneum and all its contained vessels inflate from the most minute wound, although the cavity be altogether small to be visible on the outside and scarcely visible; for often, after dissection, no intestines are discovered ruptured, and no fluids have escaped into the abdomen. In subjects who die after lightning, we find the cavity of the peritoneum universally inflated. The operation of the Causticæ vesicæ is fatal, not from any loss of blood, for there is little bleeding; nor from the gases being exposed to the air, for patients also die at whom till wounds barely and where the air has no possible opportunity of infiltrating itself; but the cause proceeds still from the inflammation, which is always directed to extricate from wounds of the peritoneum, as well as of glands.—*Discoveries on the Nature and Cure of Wounds, p. 390, edit. 3.*

But although there can be no doubt that the wound, absolutely considered, is the most frequent occasion of this dreadful inflammation, yet it sometimes happens that the inflammatory consequences arise in relation to another kind of cause. If an artery be wounded, the contents may, under certain circumstances, be effused in the abdomen; if the liver, spleen, kidney, or any large vessel be injured, blood may be poured out, and grieve the viscera; if the bladder be wounded, bile may be effused; and if the bladder be pierced, the urine may escape into the abdomen. Now all these fluids are extremely noxious, with respect to the surface with which they affect, cause inflammation, and as such they give rise to inflammation of the peritoneum and viscera.

Wounds of the belly are divided, by almost all writers, into such as penetrate the cavity of the abdomen, and into others which only touch the skin and muscles.

The former differ very much in their nature, and degree of danger, according to they do or do not injure parts of importance contained in the peritoneum. The latter are not remarkably different from the peculiarity of other superficial wounds. The chief indications are to lower inflammation and to prevent collection of matter. A few particulars, however, is the treatment of superficial wounds of the abdomen merit attention.

Superficial Wounds.—The most serious lacerations, and their successors down to the present day, have been divided into wounds of tendons and ligaments, giving rise to very important consequences. Almost the whole front of the abdomen is covered with tendons, ligaments, and so on, and it is not unusual to see a profuse wound in this situation followed by extensive inflammation and the formation of abscess. At the same time, the patient is affected with a great deal of inflammatory fever. He suffers acute pain, sickness, vomiting, and considerable disturbance of the nervous system.—(*Callan, Spéc. Chirurg. Rouen, vol. 1, p. 102. Hoffman, l. c.*)

When the tension and swelling of the abdomen, shape, and shape sometimes occur, and indicate the collection of suppuration. The matter sometimes accumulates in the ilio-colic sheath of the cæcum, and when the collection in this situation remains undischarged until a pointing appears, no more does the suppuration, or it is rejected, than an extraordinary quantity of matter is discharged. The surgeon should carefully examine the nature of this kind of case, at first, is frequently not sufficient alteration in the appearance of the integuments to denote either the existence or the extent of the suppuration.

Such an abscess forms an remarkable exception to the etiological causal rule of showing some phlegmonous processes to form of their own accord. In the present instance, there is an spontaneous expansion (involving between the abscess and the skin, and repelling into the natural progress of the matter to the surface of the body as previously as the transposition of a phlegmonous focus. But even in this instance the propensity of pus to make its way outwards is called out to form extensive influence. Though there is only a thin membrane (viz. the peritoneum) between matter collected and the cavity of the abdomen, the abscess, after a time, mostly points externally.

The proper treatment of this case is to prevent the suppurative accumulation of matter, and rapid increase of mischief, by making a depending opening, and

times at the very lowest part of the shaft of the resin
44406, 100 lbs., as soon as the judgment of matter is
fully confirmed.

However, there is a time in which it is advantageous and justifiable to make an early diagnosis of a presumed animal, in order to prevent the photo-diagnosis at macroorganisms, it is unquestionably the present moment. In fact, indeed, is particularly recommended by Collins, in relation to the strictest anthropogenic control.—*Don Spat. Civ. Mediterra*, vol. 3, p. 62, 1971.

Sometimes the scar is found between the eye and the internal oblique vessels, and spreads to a great extent. The part may even assume such a size as the abdomen, and the cancer follow. Such an example is recorded by Dr. Cresson, of Wakefield. In this instance, however, the disease preceded the carcinoma, ran a wound.—*See Edinb. Med. and Surg. Journ.* vol. 8, p. 123.

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Wounds of the abdominal muscles are sometimes the most difficult to suture, and the patient kept quiet in bed. A very important point in the treatment of wounds of the parietal part of the abdomen, is to afford a degree of support to the wounded parts, so that the pressure of the viscera may be avoided. The sides of the abdomen are almost wholly composed of solid parts, which easily yield. No part of the thorax or ribs of the abdomen is supported by a bony structure, and the viscera are, for the most part, covered less completely, and are, consequently compressed by the abdominal muscles and diaphragm. They are liable to protrude whenever the resistance of the surrounding parts is not sufficiently powerful. Hence, all wounds of the abdomen, especially those in which biliary impaction and necrosis have been met, demand exact attention to the means of supporting the wounded parts, and that, though the patient may think it should not happen to be avoided. The patient ought to keep as much as possible in a horizontal position, and suitable compresses and bandages should be applied. And, in order to guard against hernia, a patch should be supported in this way a considerable time after the wound is healed.

The performance being discussed by means of fuel air substance with the same volume of the alcohol, requires there is always some risk of the inflammation of these parts extending to that membrane. The danger must be avoided by the extreme employment of a hygienic treatment. What renders the reaction more dangerous is, that where one part of the period is affected, the neighbouring usually spreads with particular rapidity over the whole extent, and so it often falls.

As important rewards of the program are to be based on the general principles applicable to all teaching awards in other institutions, it is hardly necessary to state that these by the first intention, if possible, are not to be attended.

—The first thing which the suspect is generally made to know, when he is brought to a show-up of the fact is, whether the accused possesses the curfew of the accused, and whether any of the various are injured.

[illegible]

When the vessel is sufficiently large to admit of

Singer, a surgeon, can always check whether the baby actually falls into the abdomen, because not much time elapses between the time the baby is cut open and the time that cavity, and the contained contents, may be taken out. There is no chance of deep probes, however, and so from the possibility of mistaking the inside of the stomach for the rectum muscle for the uterus, if the probe is used, and since the veterinarian is not a medical graduate, particular caution should be used in forming a judgment of the nature of the mass, but the presence of such anal sphincter, that a very short tube will make the insertion of probe considerably better to use. Any investigation of this kind should always be considered, if possible, when the patient is exactly in the same position as when he lay in the time of parturition, or when he was born. Especially, if the animal were somewhat to be kept in the state of the position of the cavity or its thickness. This short experiment is not very easily completed. It is well known to the contrary, and the space, around the cavity of the abdomen, is not completely filled with the various organs, and in a general, we suggest, fluid would not be likely to fall into the bag of the peritoneum, as an ordinary person might suppose. And if it were poured out, it would be quite as likely to fall into the cavity of the abdomen as to fall into the cellular substance of the stomach. The least curiosity of the animal, or a pair of lower, or overactive, laying against the abdominal side of the body, would also completely prevent the London from passing into the abdomen.

When a considerable quantity of blood issues from a wound of the skull, we, without previous examination, are certainly, that some large vessel has been torn or injured. Excepting the epigastric artery, which crosses the forepart of the abdomen, along the right margin of the rectus abdominis, no large vessel is distributed so near the surface and large vessels. At the same time, the serving of particular notice, that a large artery might be exposed in the shoulder, and not a drop of blood be discoloured from the wound.

In such cases, the consequences require a healthy and to a suspicion of what has happened. The most common complaints of various diseases are: loss of appetite, loss of weight, and if the illness should not specifically come, these symptoms are also called disorders.

Examples like the catarrhs of the second law, activity of the abdomen is from the first law, namely, being indicated by the evase of this, have some feces, in other words. The vomiting of a considerable quantity of blood, or its discharge by stool, and also the other signs, are from the first law, namely, they are from a wound which does not usually penetrate the abdomen, or the kidneys, and, and thereby may be held to be one of the abdomen, because they are not outside of the cavity of the abdomen.

When some of the above symptoms occur, while neither this danger, nor the grave risk to be apprehended, when some of the fluids become to be absorbed in the various receptors in the abdomen, transferred from the viscera, when the pulse becomes small, and the pain is not excessive, there is reason to hope that the vascular has not injured parts of greater importance than the integument and muscles. (Etiologia, 20.)

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at once lay the belly flat and close the wound. By placing the walls of the abdomen are not flaccid, nor the cavity empty, but the abdomen full, and that the muscles which cover it contract strongly, the effect being to exert a particular, for the moment that the belly is contracted, the action of the vessels would have all part of the blood; the contraction of this action is necessary to regenerate the wounded surface; and the contraction of the abdominal muscles and the diaphragm against all the vessels of the abdomen, prevents any access of air externally, thus though we should hold such a wound open with our fingers, no air could pass into the abdomen, further than so that place is put into it first treated with the finger, whose we thrust it into the abdomen. Nothing is necessarily exposed to incise, except that piece of intestine which is without the abdomen, or that which we see when we expose a small piece of the bowels by holding aside the lips of the wound. The pressing forward of that piece, and the protrusion of a portion of the gut, prevents always in the case of the wound, the pressure from behind, keeping that piece protruded, so that it is with difficulty we can push it back with our finger; this increased pressure in all directions is an absolute security against the access of air. The intestine comes out, not like water out of a bottle, the sides of which tube are supplied by air existing into the bottle, in proportion as the water comes out; but the gut is pushed down by the action of the muscles made of the abdomen, and this action follows the intestine, and keeps it down, and prevents all access of the air, while the gut contracts thus protruding, so whether it be reduced; for if it be reduced, the walls of the abdomen yield, allowing it to be thrust back, but admitting no air. Those who want to know the effect of air, distilled within the cavity of the abdomen, must make other experiments than merely cutting open the belly;—they must give us a fair case, instead of this unnecessary word. We will not allow them to say, when they cut open the belly of any creature with a long incision, that the inflammation comes from the air; much less shall we let them say, when they open the belly with a smaller incision, not by that little incision the air goes into the abdomen, and that all the bowels are exposed to the air. (Lectures on the Nature of Wounds, p. 323, 324.)

In answering to the question, whether air is so important to the cavity of the body as many have supposed, Mr. John Bell continues with much spirit and success the opinions published on this subject, by Dr. A. Moreau, in his account of the horse section, as the attached quotation will show. "That the virtue should believe the first superficial impression that strikes them of air entering a wound were, in my no mean surprising; but it is so certain that men and in philosophy should adhere so strongly an opinion as that without some kind of proof. Thus the air which we breathe, and which we feel upon the surface so hard and disagreeable, would have to express a virtue in the normal parts, which would there be a stimulus more violent and more dangerous than the air, is not to be believed upon slight grounds. I do often hear Mr. John Bell that it is useless to be proved that this fluid, which seems so bland and pleasant to all our senses, and to the outward surface, is yet a horrible stimulus, when admitted, as a celebrated author grandly expresses it, 'that the deep recesses of our body.' (Moreau's *Revue Médicale*.)

With how much reason Mr. John Bell objects, that this doctrine is unscientific, will be manifest to every man of our discernment and impartiality.

The air, for instance, escapes from the lungs, in a freshened life, and that goes about into the blood, then into the capillary vessels; then the capillary vessels contract, and the air is absorbed; but often without any contractions, with very little care and assistance on our part, the air is absorbed, the fullest capillary, and without inflammation of the chest, or any serious danger, the men get well. How then is the air, within the cavity of a dead air filling the thorax, and opposing the lungs, without any dangerous inflammation arising?

That the air may be pushed into the capillary vessels covers all the body, without causing inflammation, in every part from the more dependent cases of emphysema, where the pressure, after living cells at sea

dry, have died, set from inflammation, and from expansion slowly, the body being so crisscrossed with vessels, even the vessels have, upon dissection, that fixed in tension to open bloodless. We have also many instances cases of this kind, which prove this is not perfect contraction. Soldiers and sailors sometimes break the vacuum with a lance, introduce a blow gun, and blow it up in an emergency, without being hurt, by which they hope to escape from the vacuum. The old story of a man who was so wicked as to make a hole in his child's head, and blow it up, that he might show the child in the streets of Paris for a wonder, is well authenticated; and I have, I think, met a soldier, who knew how to do this, would blow a top every evening, and squeeze it out when he put the child to bed at night. Some violent hunters having a prize at a soldier, found him lying dead under a hedge; they made a little hole in his neck, and then his spirit he was like a bladder, as the English proverb the disease of emphysema, his a wretched man." (P. 324, 325.)

After many other pertinent observations, blended with appropriate satire on the extravagant notions advanced by Moreau, on the bad effects of the air, in this case, operations for testis and hydrocele, the English section, Dr. John Bell now jumps into the air, to indicate the propriety of Dr. Moreau's proposition that the gut appears with the force of a steam bath is so to inflate the air. "This, though it may seem to be a strong piece of wit, was really proved in some recent experiment. But since Mr. John Bell the admission of atmospheric air, as a stimulus, while compared with the great increase of inflammation, of testis, of hydrocele, of the disease, nature of the lungs, is no more than the drop of the bucket in the waters of the ocean. And it is just as just as to say, that after such droughty operations, some organs are inflated by the admission of air, as it would be to say (as Moreau do), that when a man is run through the peritoneum with a red hot poker, that the heat and prickliness are inflated by the admission of the air." (P. 327, 328, 329.)

Enough, I conceive, has been said to dispel all the idle fear and prejudice which have prevailed concerning the bad effects of the air in wounds of the abdomen, as well as several other cases. When I lastly present a case as Dr. Alexander Moreau, which was disturbed by such apprehensions, it is not without this many a poor ordinary member of the profession should have been terrified nearly out of his wits upon the subject; and for quailing this alarm and exposing its absurdity, I freely thank Mr. John Bell for saying of scientific praise.

It cannot, in all cases of wounds of the abdomen, be an excellent rule never to be efficient about wounds which may take place, nor to take pains by such experiments to have been devised for setting positively what best is wounded. It is quite too much to interfere when the signs of the present condition are suspicious which may be wounded. A great deal of harm is frequently done by bleeding and discharging the wounded parts more than is necessary, and it is not known, that wounds of the abdomen with alarming symptoms frequently have a favorable termination. Swords, lances, and other weapons sometimes pass completely through the belly without the least suffering afterward any threatening symptoms, or indeed any effects which, obviously considered, would authorize the inference that the victim had been at all injured. Severe inflammation may be set on in suppuration, and when set is formed it is soon, often absorbed again. Nothing then is to be done for the discharge of pus, but rather to the abdomen, unless the fluctuation and extension of the abscess be very distinct, and the quantity and position of the matter clearly profuse. If inflammation under these circumstances, the surgeon should make a cautious puncture with a lance.

Prevention of the Future.—The condition of small intestines are the most liable to protrusion, but in large wounds the great intestines are wounded, and upon the liver and spleen may project through the opening. The general expression indicating a protrusion of the parts are sufficiently obvious; but it is desirable attention, that in the subjects the above membranes may project from the wound, and yet be universal of the appearance of success. The ap-

and symptoms are to be collected from a knowledge of the natural situation of the parts, and indicating what region of the abdomen is wounded.—(Cullenn, *Epileptic. Therap.*, t. i, 792 and 793, edit. 758.)

From penetrating wounds considerable portions of the bowels are sometimes protruded; and though these viscera may not have received injury, yet their being displaced is immediately productive of fatal consequences.

The best mode of governing such mischief, is to return the viscera into the cavity of the abdomen as speedily as possible. Almost all authors recommend returning the displaced parts, previously to the attempt at reduction; but, in giving this advice, they seem to forget, that while time is lost in this poperly necessary measure, the protruded bowels suffer much more harm from exposure, than is to say, from the very circumstance of their being out of their natural situation, than they can possibly receive good from any application made to them. No kind of emollient can be said to be useful as the internal warmth and moisture of the cavity of the abdomen. In order to facilitate the return of a protruded piece of intestine in situation, the abdominal muscles should be relaxed by placing the patient in a supine posture, and the large intestine emptied with a clyster. As spontaneous haemorrhage, if it is not checked, that hemorrhage should delay the attempt to reduce the part until the vessel has stopped. So, this measure is only counteracted as soon that may become serviceable in case the viscera cannot immediately accomplish the object in view.—This necessary caution always to be observed before the intestine, the intestine before the protrusion; but the last protruded portion of each of these parts ought to be the first reduced.

It is only when the intestine and omentum are free from spasms and mortification, that they can be safely to be returned into the cavity of the body without hesitation. Also, when the protruded parts are covered with sand, dirt, or other extraneous matter, they should be tenderly washed with a little tepid water.

For the reduction of the parts, the fore-fingers are the most convenient, and it is a rule to keep the position that returned from protruding again by one finger, until it has been followed by another position introduced by the other finger. The second part is to be kept up in the same way by the finger next to return it, and so on, till the displaced parts have all been put into their natural situation.

In attempting to reduce a piece of protruded intestine, the patient should be placed in the most favorable posture, the head and chest should be elevated, and the pelvis raised with pillows. Nothing can be more absurd than the advice to put the thorax rather lower than the pelvis, in order that the weight of the viscera may tend to draw upwards the protruded parts. This is another erroneous idea, arising from the ridiculous supposition, that a great part of the abdomen is actually an empty cavity. The relaxation of the abdominal muscles is a much more rational and useful object. When this is properly attended to, the above directions are observed, and the wound is not extensively lacerated, in relation to the bulk of the protruded viscera, the parts may generally be reduced. But in addition to what has been already stated, it is necessary to remark, that the pressure should be made in a straight direction into the abdomen; for when, much obliquely towards the edges of the wound, the parts are drawn in, to suffer contusion, without being reduced, and even to pile between the layers of the abdominal muscles, and become strangulated. When the wound is in the front of the abdomen, pressure made in this unskillful way may force the viscera into the sheath of the rectum muscle, and cause the same serious symptoms as arise from an incisional hernia.—(See *Hernia*.)

When the reduction seems complete, the viscera should more loosely be held, by introducing the finger into the cavity of the abdomen, so as to feel that the parts are all snugly reduced, and suffer no constriction between the edges of the wound and the viscera in the abdomen.

A difficulty of reduction may arise from the protruded intestines being dominated with feces or air. In this circumstance, the contents of the gut may frequently be made to pass by degrees into that portion

of the intestinal canal which is within the abdomen. In order to accomplish this purpose, the surgeon must press the contents of the bowel towards the wound, and if he succeeds in emptying the gut, he will consequently experience equal success in his next attempt to reduce it in the abdomen.

Sometimes, in cases of narrow straits, considerable pieces of intestine protrude, and cannot be reduced without doing immediate violence to the bowel. Under these circumstances, the dilution of the bowels is indispensable. However, when the reduction seems at least a matter of impossibility, an attempt to the reduction of the rectum, if the surgeon be careful to relax the abdominal muscles, draw a little more intestine out of the wound, and gently press the contents of the bowel through the constriction in the abdomen, he will frequently succeed in reducing the parts without using the knife.

When such expedients are unavailable, the dilution should be made in a direction remote without endangering the sigmoid artery, and, if possible, in the same line as the muscular fibres.

We are also advised to make the intestine spread rather than downwards, where it can be done with equal convenience, because it is supposed the first direction will be followed by less danger of necrosis.—(See *Hernia*, *Medical Operations*, t. i, p. 229, et seq. Cullenn, *Epileptic. Therap.*, t. i, p. 793.) If, however, the appearance of the wound corresponds to the direction of the superior ligament of the liver, within advice making the dilution at the lower angle, in order to issue no risk of hemorrhage from the vascular system. In the adult this vessel is generally obliterated, and lined with a ligamentous substance; though it would appear that, in a few instances, it remains pervious to the bowel. Hitherto no young persons have died in consequence of a stick in the belly between the false ribs and the umbilicus, and on opening the body, the intestines issued from a wound of the middle of the abdomen. It has been feared also, that cutting the superior ligament of the liver might give rise to such a displacement of that vessel as would interrupt the freedom of respiration, or obstruct the circulation of the blood in the venous system. But the supposition is unfounded; for Richter found this ligament ruptured and separated towards the liver in a violent Abdominal bleed down whose respiration had not suffered, any particular disturbance during her illness.—(See *Medical Operations*, t. i, p. 229, 231, et seq.)

The incision should never be deeper than absolutely requisite, as laceration is much disposed to occur wherever the peritoneum has been divided. The operation may be done with a curved bistoury and a director, much in the same way as is done in cases of strangulated inguina.—(See *Hernia*.)

After the death of Wateline many cases presented themselves in which the bowels and omentum protruded, and in several of these examples the reduction could not be effected before the viscera had been enlarged. So lightly also were the parts put, that the operation was sometimes for free being easy.

Instead of enlarging wounds of the abdomen, a ligature proposed to cut the air from the protruded intestines, by making small punctures with a needle, so as to loosen their adhesion sufficiently to make them reducible. The suggestion first originated with Pott, who declares, that he had practised the method with success. However, his contemporary, also informs us, that his plan was adopted by another surgeon, in an instance where the epigastric region was distended, and a large portion of the intestines protruded in a strangulated state. Peter Lever, an English surgeon, likewise assures us, that he frequently adopted the practice when other means failed. Garside, Sharp, and Van Meulen are all advocates for Pott's proposal; but they recommend the employment of a round needle, which will surely separate the fibres of the intestinal vessel without cutting them, as a far more rational, simple, and useful mode would undoubtedly do. These gentlemen, however, only mention the practice when the quantity of protruded intestine is great, and the bowel is so remarkably distended with air, that it would be impossible to reduce the part, though the wound were enlarged, and every thing else put in practice likely to bring about the reduction. But, as Sabatier remarks, the punctures must be carefully made, it made with a fine needle, since they will be in-

medicinally stopped up with various substances, with which the wound is constantly covered, and if the surgeons are made with a broad triangular section of a very large round case, as Deane and Croquet advise, they will be highly dangerous, inasmuch as they are likely to give rise to inflammation, and even to extrusion of the abdominal contents.—*Wanderer's Operative*, t. i. p. 16.

That small punctures in the breast would not prevent the progress, but be obstructed by the violence of the wound, is a fact which has been for a long time well known to surgeons. Chalmers, among others, has particularly noticed it: "any puncture made full size with any sharp instrument, whether lancet or other, is immediately closed." &c.—*Syst. Clin. Med.* t. 3, p. 704.

It was the consequence of small punctures being made, that led Deane and Croquet to recommend the use of a large round needle. "vous que l'ouverture est plus grande par les instruments dont les autres sont munis." But they were also aware of the danger of exposing such an instrument, since they give as directions how to proceed, in order to prevent inflammation and infiltration: "On percevra l'épave sans des videries chirurgicales en point, avant de réduire l'ouverture, sans avoir de fil dans la partie se maintenir qui repousse le piquet pour la fixer contre les bords de la plaie extérieure; et l'on cautérise par les règles générales l'épave qui est piquet pour éviter."—*Traité des Maladies Chirurg.* t. 3, p. 123. Richardson is still an advocate for puncturing the breast, for which operation he fully recommends a small hydrogale needle.—*Wanderer's Clin.* t. 3, p. 326, et 4.

Mr. Treves, one of the latest and best writers upon this subject, most properly joins in the condemnation of the plan of puncturing as protruding wounds. "But, said and others protested against this practice, on the very sufficient ground of its necessity. In Paris very truly says, it is useless as well as dangerous practice; for the opening made by a round needle causes pressure to the contained air." Mr. Treves then cites two cases, showing that a very small hole in a breast will not prevent its becoming distended with air.

"A man was brought to St. Thomas's Hospital on Saturday, the 30th of June last (1811), who had been stabbed in the region of the epigastrium, on the left side of the abdomen, by a saw-bite. He died in eighteen hours, apparently from the sudden rupture of hemorrhage which had taken place within the belly. About half a pint of blood was protruded. The gut was highly distended, and so much distended, notwithstanding it was punctured in three places, that the protrusion of the intestines required it to be freely released before it could be returned. The aperture, given in fact, adhered by the nature of the fluid."

"It happened upon the case of Captain Richardson (Ann. Reg. June, 1800, for the murder of his father), that the intestine had been exposed protruding through a wound near the left nipple, and had been exposed the first or the last; that the gut had passed through one hole of intestine, and protruded again; that the wound of intestine was only as a hole; that the collection could not be accomplished upon the general wound was closed; and that the intestine was then returned, and the integuments sewed up."—*Treves's Reports of the Dissections*, p. 174, 175.

With respect to this last case, however, I must observe, that it does not satisfactorily prove what the author intends, namely, that the breast was distended with air though there was a wound in it half an inch long; for the evidence does not inform us that the difficulty of reduction was owing to this cause. I have seen a very small portion of intestine protrude through a wound, and baffled all endeavours to reduce it for nearly an hour. The first case noticed by Mr. Treves, however, is more explicit and interesting, and we are to infer from it, and the observations of Mr. Chalmers, that the puncture made is an incision, not closed by nature, as Deane and Croquet have asserted, but by the adhesion of blood.

As the above evidence has been recommended by writers of some weight, I thought that the subject should not be passed over in silence, and in doing so, I am, as the reader perceives, not only confined to the method. The plan does not furnish the evidence

of the operator; there is not even a satisfactory answer in favour of the practice; and though it may be said, as Deane and Croquet have said, that the puncture is made by a large needle, which would give the least knowledge of the extent of the wound, yet every surgeon who has seen the smallest puncture made in the breast, must be satisfied with great degree that it would not be closed by a wound of that size and nature. Besides, the air may frequently be proved to be of the incision in a short way, as I have already described.

A wound of the abdomen, attended with one of the most considerable protrusions of the viscera, has been ever read of, as recorded by Mr. Hays, surgeon at Kingston.—"August 20th, 1808 (says this gentleman), I went to North Mills, where, four miles west hence, I saw John Brown, at 72 years of age, who had sustained a wound in the abdomen from a part of a wheelbarrow. On my arrival, which was little more than an hour after the accident, I found the patient in a very alarming situation; the great side of the stomach, and the whole of the intestinal canal, distended and extruded, protruded within the abdomen, having protruded through the wound. The protrusion was about half of the body, commencing at about two inches below the umbilical circle, and extending to a straight line some five inches in length, distant from the centre of the rectum, and it was quite round, and had seemed so as to empty the stomach. Very little blood was lost. I immediately proceeded very carefully to examine the protruded viscera, each of which were wounded, and reduced them as quickly as possible beginning with the stomach, and following the regular course of the intestine; at the latter portion of which I finally discovered the cause of the protrusion. It was a piece of some pain during the reduction, though not much, and expressed great relief when the parts were completely returned. I now desired an assistant to lay the patient on his back over the wound, and make some pressure upon it; for I found that if the parts would not have protruded again by the action of respiration, which was oppressed and laborious. I thought the state of the wound together with the nature, requiring first above pressure, and passed the needle on each side, quite through the intestines with the perforators, &c. The wound was now dressed with adhesive strapping, and covered with a bandage."—(Vide *Edinburgh Medical and Surgical Journal*, vol. 3, p. 125, &c.)

This case is interesting, for attending to the treatment of protrusions of the viscera, and the nature of the parts being left exposed for some time, then, on a later, a recovery ensued, under the judicious employment of bleeding, incision, &c.

In La Charité de St. Etienne, or Lyons, after the battle of Waterloo, the number of protrusions of the viscera which fell under my notice was much more considerable than what I previously had any idea of ever meeting with. I well remember, in my own part of the hospital, two protrusions of a large portion of the stomach, three of the smaller, and six or seven of the mesentery, mesocolon, &c.

Whether a surgeon should be and when despatched intestine is a subject which will be treated in considering wounds of the abdomen.

Some of the exposed intestine may have mortified before the arrival of surgical assistance. In such a case, this event is rare; but in some of the most severe, it is not uncommon. The prognosis is explained in the article *Wound*.

When the protruded intestine is in a state of inflammation, or in a state of relaxation, or in a state of spasm, the surgeon must first be set every day right. When the inflammation is considerable, the bloody reaction of the dilated part, and the requirement of suppuration, means, will often prevent progress. The daily, however, darkened colour of the intestine may induce the practitioner to suppose that the part is already mortified, or near being so, because, and consequently, to set every day, setting a day in several situations. But before reaching the conclusion of the case, the surgeon, in France, will state that it is not in a state of necrosis. The complete recovery of a portion of intestine in a short time is always a matter of uncertainty; but the prognosis of speedy recovery of the part is the most

will pour out their force into the abdomen and prove fatal; though we should settle that our fair and good dissection in the theory, we find that it will never answer in practice. Soldiers never die from the most desperate wounds; and the most likely reason that we can assign for it is the nature of the abdomen; the surface, equable; and gentle pressure; and the active disposition of the peritoneum, ready to effuse with the slightest touch. The wounded intestine is, by the natural pressure, kept close to the external wound, and the peritoneum and the intestine are equally inclined to adhere. In a few hours that adhesion is perfect, which is to save the patient's life, and the life of the wounded intestine is given to the lips of the external wound. Thus is the side of the abdomen distended to the inner surface of the abdomen; and, though the gut comes out in front while the wound is open; though it often falls down out more freely while the first inflammation lasts; yet the force resists this regular course whenever the wound is disposed to close.—(John Bell's *Discourses on Wounds*, p. 322, 323, 324.)

The foregoing extract, though short, is a careful study, contains such observations as are well estimated to make the reader understand, that the abdomen is in reality not a cavity, but a compact mass of coexisting and contained parts; that the close manner in which the various surfaces are constantly in contact must powerfully oppose extravasation; and that, in fact, it often entirely prevents them. The passage of impressions up to the cavity of that space propensity to the adhesive inflammation which permeates throughout every peritoneal surface, and which not only often has the effect of successively limiting effusions of the contents of the viscera, by uniting the parts together, but which, even when an extravasation has happened, beautifully confines the effusion close in its mass, and separates it with each adhesion of the parts in such other as are rapid in their solution and efficient for the purposes of limiting the extent of the effusion, and preventing the initiation of the extravasated matter from affecting the rest of the abdomen.

It is to Bell that I am indebted for more correct notions of thinking upon the foregoing subject; and it is with great pleasure that I have referred to his valuable observations.—(See *Mem. de l'Acad. de Chir.*)

But notwithstanding the reciprocal pressure of the coexisting and contained parts against each other, and the useful effect of the quickly arising adhesive inflammation, in all penetrating wounds of the belly, complicated with laceration of the viscera, we are not to suppose, that extravasation never happens; but only that it is much less frequent, than has been commonly supposed. Mr. Treves, with much lucid industry, has succeeded to trace, more minutely than any preceding writer, the peculiar circumstances under which effusions in the abdomen are likely or unlikely to happen. "It being admitted (says he) that there are cases in which effusion does take place, it is easy to conceive circumstances which must considerably increase this event. If, for example, the stomach and bowels be in a state of tension, the matter which follows the injury will exclaim that side. If the extent of the wound be considerable, the matter will more readily pass through the wound than along the canal. A wound of the same dimensions in the small and large intestines will most readily exclaim, the former than the latter, because it bears a larger proportion to the cavity. Incised and punctured wounds admit of the adhesion of the cut edges or the eversion of the internal end of the gut, so as to be in many instances actually obliterated, whereas, lacerated or elevated openings do not admit of these salutary processes. Again, in a transverse section of the bowel, contraction of the circular fibre closes the wound, whereas, in a longitudinal section, the contraction of this fibre enlarges it. Such (says Mr. Treves) are the circumstances which concur, in a greater or less degree, to facilitate the tendency to effusion."—(On *Exterior of Injuries*, &c. p. 13, 14.)

After the details of some experiments and cases, the preceding author enters, among other mechanisms, the following:

1. That effusion is not an ordinary consequence of penetrating wounds.

2. That if the gut be full and the wound extensive, the surrounding pressure is overcome by the internal

action of the bowel tending to the expulsion of its contents.

3. That if food has not recently been taken, and the wound amounts to a division of the gut, or, nearly so, the exertion and contraction of the fibres of the gut prevent effusion.

4. That if the canal be empty at the time of the wound, no subsequent state of the bowel will cause effusion, because the supervening inflammation agglutinates the surrounding surfaces and forms a thrombus; but the effusion takes place from a hole at the wound full, provided it remains a certain period of its cylinder tense, the wound not admitting fully in a semi-division of the tube, for then the tension and contraction are too partial to prevent an extravasation.

5. That when, however, air has escaped from its bowels, or blood has been expressed in quantity within the abdomen at the time of the injury, the distance made to effusion will be less effective, although the peritoneal pressure is the same, as such fluids will yield more readily than the solids naturally in contact.—(P. 15, 16, 17.)

6. That though extravasation, as just shown, is preventing wounds, it follows more generally in cases where the bowel is ruptured by blows or fallings on the belly, while the integuments continue unscathed.—(P. 18.)

7. That when the bowels are irritated by absorption, there is more tendency to effusion than in cases of wounds.—(P. 18, 19.)

Mr. Treves proceeds to explain the reason of the greater tendency to effusion in cases of laceration than by violence thus in cases of abrasion, "by the difference in the nature of the injury which the wound wounds were provoked by a sword or burn, it is in one case, in kind or affecting, in the other. A wound by a sword or burn could only take place under a decided state of the bowel, a roadster and falling in effusion, and from the nature of the part, a rupture so produced would seldom be of decided extent. The process of absorption, by which an aperture is formed, commences in the internal coat of the bowel, which has often discovered a more extensive lesion than the peritoneal covering. The peritoneum can scarcely be torn, as it is a point or line; the internal wound is an actual loss of substance. The consequence of this difference is, that while the former, if small, is glued up by the effusion from the cut vessels, or, if large, is nearly obliterated by the full eversion of the viscous coat, the latter is a permanent rent."—(P. 19.)

How much Mr. Treves and Mr. John Bell differ in opinion upon these latter points, will appear from the following passage: after admitting to the admission, which makes place between the wound and the peritoneum, under a variety of circumstances attending disease, Mr. John Bell observes, "This is a subject which the chief difference, in point of danger, lies in the lacerated and a wounded intestine; for, in a wound, there is, as we should suppose, no time for adhesion, nothing to keep the parts in contact, because to stop the effusion might be produced. This is as clear as day in a slow disease, tedious inflammation, whereas first, and phlegm and burning afterwards, sometimes a focus remains discharging pyrexia, and sometimes there is a perfect cure. If a wall shell, a large one, a small, or any dangerous form be introduced, it stops in the stomach, causing swelling and dreadful pain; it first lacerates, then it tears, and then it ruptures; the bowels open, the food is discharged at every breath, till the fluids gradually become and leave it full; then the stomach is torn with a violent rent of a vessel, the blood from the wounded artery vessels, or the food itself, so often pours out in great abundance, and the patient dies."—(On *Exterior of Injuries*, &c. p. 13, 14, 15.)

The author afterwards proceeds to explain how, in cases of penetrating wounds, the complete state of the containing and contained parts, and the constant and variable pressure which the viscera exert, frequently hinder effusion.

Which of these positions is most correct I cannot determine to determine; and whether Mr. Treves' cases are deviations from what is most common, or only be decided by a comparative consideration of a greater number of facts. When the viscera are lacerated, and thus rid themselves of foreign bodies, the great force of the same is forced indubitably affects it

will pour out their force into the abdomen and poorer still; though we should wish this as a fair and good discussion in the theory, we find that it will never answer in practice. Soldiers moreover daily find the most desperate wounds and the most fatal wounds that we can imagine for us the effects of the abdomen; the external, equine, and groin wounds; and the active disposition of the peritoneum, ready to inflame with the slightest touch. The wounded intestine is, by the internal pressure, kept close to the external wound, and the peritoneum and the intestine are equally inclined to adhere. In a few hours that adhesion is begun, which is to save the patient's life, and the life of the wounded intestine is given to the life of the external wound. Thus in the side of the intestine is the inner surface of the abdomen; and, though the gut runs out in front while the wound is open; though it often runs from out more freely while the gut is inflamed, but, yet the force retains their regular course, whether the wound is closed or open."—*John Bell's Dissections on Wounds*, p. 326-327, ed. 3.

The foregoing extract, though directed to a careless eye, contains much observation as are well explained to enable the reader to understand, that the abdomen is in reality not a cavity, but a compact mass of contracting and contained parts; that the close manner in which the various surfaces are constantly in contact must powerfully oppose extravasation; and that, in fact, it often actually prevents them. The power of the adhesions in with the ability of that quick propriety in the adhesive inflammation which prevails throughout every peritoneal surface, and which not only often has the effect of permanently binding off the ends of the vessels, by uniting the parts together, but which, even when an extravasation has happened, immediately coagulates the effused blood in one mass, and surrounds it with such adhesion of the parts as each other as not move in their location and efficient for the purpose of limiting the extent of the effusion, and preventing the intrusion of the extravasated matter from affecting the rest of the abdomen.

It is to be noted that surgeons are enabled to make correct decisions of plucking upon the foregoing subject; and it is with great pleasure that I here refer to the valuable observations.—*See Wm. de F. Jones, de Chir.*

But notwithstanding the natural pressure of the contracting and contained parts against each other, and the useful effect of the quickly acting adhesive inflammation, in its penetrating wounds of the belly, complicated with laceration of the viscera, we are not to suppose, that extravasation never happens; but only that it is much less frequent than has been commonly supposed. Mr. Trauer, with much laudable industry, has endeavored to trace, particularly those are preceding writers, the particular circumstances under which effusion in the abdomen are likely to take place. "It being admitted (says he) that there are cases in which effusion does take place, it is easy to conceive circumstances which must considerably facilitate this event. In the example the stomach and bowels be in a state of engorgement, the vessels which deliver the injury will maintain that state. If the extent of the wound be considerable, the matter will, more readily pass through the wound, than along the canal. A wound of the side discloses in the small and large intestine, but more readily extrudes the former than the latter, because it bears a larger proportion to the latter. Internal and peritoneal wounds admit of the adhesion of the cut edges or the eversion of the internal coat of the gut, so as to be in many instances actually obliterated; whereas, lacerated or incised openings do not admit of these salutary processes. Again, in a transverse section of the bowel, compulsion of the circular fibres closes the wound, whereas, in a longitudinal section, the contraction of the fibres enlarges it. Such says Mr. Trauer are the circumstances which combined, is greater or less degree, facilitate or disallow the tendency to effusion."—*On the Effects of Lacerations*, &c. p. 13, 14.

On the details of some experiments and cases, the preceding author states, making other conclusions, the following:

1. That effusion is not an ordinary consequence of penetrating wounds.
2. That if the gut be full and the wound extensive, the surrounding pressure is overcome by the natural

action of the bowel leading to the expansion of its contents.

3. That if food has not recently been taken, and the wound amounts to a division of the gut, or nearly to the extension and contraction of the entire of the intestine, effusion.

4. That if the canal be empty at the time of its wound, no subsequent state of the bowel will cause effusion, because the supervenient inflammation affords limits to the surrounding surfaces and forms a vascularised sac; nor can effusion take place from a laceration of the intestine, provided it retains a certain portion of its elastic power, nor would any extravasated matter be a small amount of the tube, for then the extreme end contraction are too partial to prevent extravasation.

5. That when, however, air has escaped from its vessel, or food has been extravasated in quantity within the abdomen at the time of the injury, extravasation made to effusion will be less efficient, although the partial pressure is the same, as even from this source seems readily that the solids externally is common.—(P. 25, 26, 100.)

6. That though contraction is not common in penetrating wounds, a fibrous sac generally is found where the bowel is ruptured by laceration or laceration, while the fragments continue to contract.—(P. 26.)

7. That when the bowels are perforated in many places, there is more tendency to effusion than in cases of wounds.—(P. 26, 50.)

Mr. Trauer attempts to explain the reason of the greater tendency to effusion in cases of laceration and in violent laceration than in those of incision. "By the difference in the nature of the injury which the former wounds is often perforated by a sword or bone, as it is incision, or blunt or perforated, in the other. A wound or laceration could only take place under a divided state of the bowel, a condition just fit to permit effusion, and from the texture of the gut, a rupture so produced would seldom be of limited extent. The process of ulceration, by which an aperture is formed, commences in the internal coat of the bowel, which has always increased a more extensive laceration than the perforation covering. The position or position is a solution of continuity in a point or line, the wound wound is a small loss of substance. The consequence of this difference is, that while the former, if small, is closed up by the effusion from the cut vessels, it is large, is usually differentiated by the first entrance of the effusion, the latter is a permanent orifice."—(P. 40.)

How much Mr. Trauer and Mr. John Bell differ in opinion upon these latter points, will appear from the following passage: after admitting to the admission, which takes place between the viscera and the peritoneum, under a variety of circumstances already known, Mr. John Bell observes, "This is a point upon the chief difference, in point of danger, between a lacerated and a wounded intestine; for, in a wound, there is, as we should suppose, no time for adhesion, nothing to keep the parts in contact, so that by which the adhesions might be produced. But in a case where there is a point disease, laceration inflammation, adhesion, and adhesion and healing afterwards, sometimes a cicatrix remains discharging freely, and sometimes there is a perfect cure. If a particularly large wound, a laceration or very dangerous laceration be sustained, it is likely to be a wound, causing swelling and dreadful pain; in such a case, from internal pressure, and from the suppuration, the bowel comes, the gut is torn beyond all repair, and the fluids gradually issue and leak out. But where the stomach is cut with a broad wound, or a laceration, the fluid from the torn vessels issues, and the food itself, the other portions of the stomach, and the contents of the gut, &c."—(*Dissections on Wounds*, p. 321, ed. 3.) The author afterwards proceeds to explain that, in cases of penetrating wounds, the natural state of the contracting and contained parts, but no amount and equal pressure within the viscera exists, frequently leading to effusion.

Which of these propositions is most correct, I cannot presume to determine; and whether Mr. Trauer's view are deviations from what is most common, can only be decided by a comparative examination of a greater number of facts. When the direction of the wound and then not themselves of being, but the general tenor of the case on record undeniably affords a

time season to be apprehensive of extravasation. Yet, with respect to prognosis of the extravasation from other causes, circumstances may be very different. And it is not justice to say, that Mr. Thomson's opinions have received some confirmation from his (supposed) case, published by Dr. J. Chapman, of Belfast. It is a strange example of rigour of the stomach, and fatal effects of its contents into the cavity of the abdomen. The patient was a young lady, aged 18. She was suddenly taken ill with pain in her stomach, and other severe symptoms, and died in about twelve hours. "On opening the abdomen, the stomach was observed to be full of food, and empty. The intestines, among which were recognized oatmeal and cauliflower, had escaped into the cavity of the abdomen through a round aperture situated on its anterior surface at the union of the cardiac and pyloric portions. The perforation of the stomach was perfectly circular, about the size of a pea, and appeared to be the result of an ulcer on the very outer surface, which had gradually penetrated the other coats." This case was history and medical, fairly the size of a shilling, and had the appearance as if it had been made with a needle, with the needle in a cream."—*Dr. Chapman, Med. Chir. Trans.* vol. 8, p. 236.

To the preceding Mr. Thomson has attached much additional facts:—that in an instance of a rapidly fatal effusion of the intestinal contents through an ulcerated opening about a finger's breadth below the pylorus. The stomach had a perforated ulcer, and proved to be the cause of an irregular superficial ulcer of the stomach wall. Another case is that of a gastric ulcer of the great curvature, and fatal extravasation of its contents. In another instance, a vesicular eruption of the peritoneum, diagnosed by M. J. A. Brown's quill, was found after death on the junction of the stomach and intestine. It was near the centre of an ulcer that had destroyed the villi and mucous coat of the stomach in the stomach of this case. For many other instances of this kind, I must refer the reader to Mr. Thomson's paper, who concludes with remarking, that the chief diagnostic symptoms of these lesions are as follows:—

1. Swelling, tenderness, and excruciating pain, radiating from the epigastrium either to the navel, to the umbilicus, or to the trunk, and even to the back. A peculiar pain, the intensity of which, like that of peritonitis, exceeds the usual kind of the patient, who, within an hour from the enjoyment of perfect health, expresses his relief and declares himself cured, but if the pain be not speedily relieved he need die.

2. Greatness of the shock of pain, remarkable rigidity and hardness of the belly, from a fixed and spastic contraction of the abdominal muscles.

3. A lateral pain in some cases, and the symptoms are accepted as those of acute peritonitis and the first legislation in the adhesive stage.—(*Med. Chir. Trans.* vol. 8, p. 231, et seq.)

Blood is more frequently extravasated in the abdomen than any other fluid, but it does not always take place, when the vascular vessels are above a certain magnitude. The extravasation of the abdominal vessels is peculiar to each artery and vein, and is not only peculiar to each, but is also peculiar to each. The action of the vessels, which depends on the mechanical pressure and expansion, is modified very much by what happens in some cases of spasms for hours, attended with action of the arteries in contraction. If these vessels have in expansion, after being relaxed, the arteries which contract from them on any way which they receive is not full in the abdomen, but is propelled towards the right in the abdomen, and then makes its exit. The arteries, which are often from a ruptured artery, which is broken in the stomach, intestine, or even in the wall of the stomach, and in consequence of the rupture the blood is forced out with a large vessel. When the arteries are not relaxed, it is probable that the blood is not sufficient to keep the blood from pushing its way from the vessels, and it may be that it may be coming diffused among the contents of the stomach, and then the extravasation is confined to the stomach. The blood is forced out and accumulated in this way, it is forced out of the arteries and into the cavity of the abdomen, where it is forced out of the arteries, and by the side of one of the great vessels. The blood of the blood may perhaps take this action, or perhaps there may be some resistance in the direction that is shown, in

opening the bodies of persons who have died with such extravasations, things may put on a different aspect, and the blood may be found in the extravasated over every part of the abdomen. But when such bodies are examined with care, it will be found that the blood does not indicate itself among the vessels of the stomach, when the abdomen is opened, and the most previously seen is a large of pouch. This pouch is completely surrounded and limited by thick membranes, especially when the extravasation has been of some duration.—(*Schäffer, Médecine Opératoire*, t. 1, p. 29-30.)

Every practical surgeon should remember well, that all the abdominal viscera closely touch either each other or the inner surface of the peritoneum. This is one great reason why extravasation, any solution extremely diffused, but commonly for its own sake, as Pott, Schaeffer, and all the best moderns have noticed. The pressure of the elastic bowels, diaphragm, and abdominal muscles, not only constantly compresses enough to the diffusion of extravasated matter, but when nerves in proper it reaches the mouth of the wound. The records of surgery furnish numerous instances in which persons have been stabbed through the body, without fatal consequences, and sometimes without the symptoms being even severe. In Mr. Thomson's collection many cases exemplify this observation are quoted from a variety of sources: *Tab. Hæmorrh. Chir.* (Chirurgia), 5. vol. 74. *Revue de Paris*, 1840, 1841, 1842. *Wilmers' Surgery*, p. 231. *La Nouvelle France* (Chirurgie), 1840, 1841. In such cases the bowels have been supposed to have sealed the point of the wound, and perhaps in a few instances this may actually have been the fact; but in the probability of such examples, the bowels may have been severed, and the extravasation of intestinal matter prevented by the pressure of the viscera against each other.

The point or spot in which the extravasated blood or serum is, as mentioned by Schäffer, is formed by the same process which constitutes the matter of abscesses.—(*See Appendix*.) It is, in short, the adhesive inflammation. All the surfaces in contact with each other, and surrounding the extravasation, and such of the wound, gradually grow together to form a cavity, covered together by the adhesive inflammation, that the place in which the extravasation is lodged, is a cavity, usually minute of all communication with the cavity of the peritoneum. The track of the wound leads to the spot of the wound, but has no direct opening into the general cavity of the abdomen. The cavity with which the above inflammation frequently follows is small and minute.

It should be known, however, that extravasations are sometimes diffused in various degrees, and the viscera, being in the patient's body subjected to a great deal of action, are affected with violent spasmodic contractions of the peritoneum. These and also are also generally disposed to a great effect. As for blood, its diffusion is complete, and often leads to a further knowledge and confine the extravasation in one mass.

Symptoms and Treatment of Extravasation in the Abdomen. It should be known, however, that extravasations are sometimes diffused in various degrees, and the viscera, being in the patient's body subjected to a great deal of action, are affected with violent spasmodic contractions of the peritoneum. These and also are also generally disposed to a great effect. As for blood, its diffusion is complete, and often leads to a further knowledge and confine the extravasation in one mass.

In these cases, the symptoms which, perhaps, had disappeared under the employment of bleeding and emphysema, now reappear. A soft fluctuating tumour may be felt at the lower part of the abdomen.

sometimes on the right side; sometimes on the left; but occasionally on both sides. The pressure made by the effused blood on the urinary bladder, excites the irritating incitations to make water; while the pressure which the sigmoid flexure of the colon exerts in the course of ultimate evacuation. In the meantime, as the quantity of extravasated blood increases, the peritoneal influence. The pain grows weaker, debility ensues, the countenance becomes moistened with cold perspirations; and according to some writers, unless the symptoms prove so ominous for the discharge of the fluid, the patient falls a victim to the accident.

In the year 1755, Vacher adopted the same plan, though it did not answer (as is alleged), in consequence of the information having advanced too late before the operation was performed. Long before the time of Vacher and Ferri, a successful instance of similar position was recorded by Celsus, in a work which this writer gathered under the title of *Alphabeticae Medicorum, et Anatomes Elementarum accuratissime, causis frequentis, Corporis Humanus, et Morborum Methodo, et Libris, Accuratae Observationis, Observationum, Medicinae, et Chirurgiae peritiae, Graecae, 1601*. The method pursued by Vacher was therefore not so new as Petit imagined.

Indeed, when the symptoms leave no doubt of there being a large quantity of blood extravasated in the abdomen; when the patient's complaints are of every violent nature, and are evidently owing to the inflammation and pressure of the blood on the surrounding vessels; and when a local swelling denotes the seat of the extravasation, there cannot be two opinions about the propriety of making an incision for its evacuation.

Caution should be used, however, that if necessary, be made, a small extravasation of blood may not produce any considerable irritation. On the contrary, when the cyst containing the blood is opened, the air that enters, and that part of the fluid which should be discharged passes, and becomes so irritating as to be a true cause of inflammation. The last symptoms are also sometimes chiefly owing to the fatty dose in parts within the abdomen, and will more easily to inflammation within than early, arising either from the wound, than from the presence of effused blood. On the whole, I am disposed to give a late writer in the belief, that the practice of discharging extravasated blood from the abdomen can rarely be advisable. — See *Albani's Med. Surgery*, p. 412, et 21.

2. *Cysts and Purses*.—These are not so easily extravasated in the abdomen as blood, because they do not require so much resistance on the outside of the stomach and intestines by which these vessels are natural more through the alimentary canal, so blood requires to keep it in the vessels. However, when the vessel is large, and the blood effused at the point of the injury, or when, as Mr. Trautman has explained, it is extravasated in blood effused in the abdomen, which fluids are incapable of making effectual resistance to the escape of the individual matter, the latter may be effused.—(See *the Inquiry into the Process of Nature in evacuating Injuries of the Abdomen*, &c. p. 24.) Nothing is a better proof of the difficulty with which cysts and purses are extravasated, than the operation of an incision, when the stomach is wounded and full of stomach. In this instance, if the incision be the communication of the contents of the stomach were not considerable, they would be effused in the abdomen instead of being vomited up. A peculiarity is worthy of the surgeon's attention is, that the opening which allows their contents to escape, may also allow them to return into the stomach.

Extravasation of intestinal matter in the abdomen is attended with severe and dangerous symptoms; considerable pain and swelling of the belly; insupportable tenderness and heatings and vomiting, with which the patients are generally attacked the day after the receipt of the wound.—(Salutator, *Med. Operative*, t. 1, p. 24.)

In these cases, only general means can be employed; vomiting, sweat, immersions, low diet, perfumed rest, narcotics, &c. All solid food must be strictly prohibited. If patients can be borne without inconvenience, it is necessary the diet is the only support of the state of the system, may be increased by the application of a mustard raised the body.

If the symptoms are not quickly abated, the inflammation spreads over the whole cavity of the abdo-

men, gangrenous mischief takes place, and the patient dies in the course of a few days.

3. *Bleeding*.—Bleed, on account of its great facility, is more apt to be widely extravasated in the abdomen than either blood or the contents of the stomach and intestines. However, an account of the small size of the gall bladder, and its position peculiar situation, between the convex surface of the liver and upper part of the transverse arch of the colon, beyond of it is necessary.

Salutator informs us, that he has only seen this in one example on record. This case was communicated to the Royal Society of London, by Dr. Mead, — *No. 484, p. 341. Abdomen*, vol. 7, p. 371, 372. A wound penetrated the cavity of the abdomen, and entered the fundus of the gall bladder, without doing any material injury to the adjacent parts. The abdomen was immediately distended, as if the patient had been afflicted with an ascites, or hydropsis; but not the swelling either became or diminished, till the patient's death, which happened in a week.

Though there was a great deal of tension, there was no fluctuating tumor in the abdomen. No more than very little urine was discharged, notwithstanding purgatives and diuretics and a good deal of liquid evacuation was given. Analysis failed to find any remnant of solid matter, and the patient was extremely thin at his funeral state. There was no appearance of liver, and the pain was always violent till the last day of the patient's life, when it became remittent. After death, the intestines were found much distended, the gall bladder quite empty, and a large quantity of bile extravasated.

Salutator had an opportunity of viewing the symptoms of an extravasation of bile, in consequence of a wound of the gall bladder. The patient's abdomen swelled very quickly, the respiration became difficult, and he soon afterwards complained of nausea and pain in the right hypochondrium. The pulse was small, frequent, and contracted; his extremities were cold, and his countenance very pale. The tendings which were perceived the first day gave rise to a little relief, but the tension of the abdomen and the difficulty of breathing still continued. A third day after the patient fell into the lowest state of weakness, and he expired upon a protracted suffer. On the third day, the lower part of the belly was observed to be more free around, and there was no death in any sensation. Salutator introduced a trocar, and gave vent to a green, viscid fluid, which had no smell, and was just like that had escaped from the wound of the gall bladder. After the operation, the patient grew weaker and died in a few days. On opening the body, a large quantity of yellow bile was found around the peritoneum and intestines; but it had not penetrated itself nearly the communication of the vessels. A thick stratum covered the bowels evenly, and they were prodigiously distended. The gall bladder was obliterated, and almost empty. Tendons in fact, there was a wound about a half an inch long, depending on a similar wound in the peritoneum. The wound which had occurred in the nature and lower part of the right hypochondrium between the third and fourth false ribs, indicated from behind forwards, and from above downwards, between the cartilages of the ribs, until it reached the fundus of the gall bladder.

Salutator takes notice that the symptoms of the two cases, which have just now been related, were very similar. Both the patients were afflicted with a redness of the surface of the belly, tenderness and pain in the hypochondrium, and they were both extremely emaciated. Their pulse was extremely weak, the latter died of their lungs when, and they were afflicted with diarrhoea, nausea, and vomiting.

Salutator seems to think, as they certainly, in the wounds of the gall bladder, attended with the extension of bile, are absolutely mortal, and that no operation can be of any avail.—(See *Medicæ Systema*, t. 1, p. 31—37.)

A contrary instance, however, may be drawn from a case related by Pottius, in which a lady had lodged in the gall bladder two years.—(See *Observations de Pottius*, p. 255.) The recovery published by Mr. Pottius of Stamford, tends also to prove that some effusion of bile is not necessarily fatal. A lady about thirty years old, received a violent blow from one of the

shaft of a cart, on the region of the liver. The injury was succeeded by pain, frequent vomiting of bilious matter, great sinking, coldness of the extremities, and a weak, small, fluttering pulse. The belly was distended, and purging stools thrown up. On the third day, symptoms of inflammation began, attended with considerable pain about the liver, great tenderness and soreness of the abdomen, and frequent vomiting. The pulse was quick, small, and weak; the skin hot and dry; the tongue much coated; the urine high-colored; and there was some difficulty of breathing, and much thirst. Eight ounces of blood were taken today, the inflammation continued, and a few grains of calomel were directed to be given every five hours, until the bowels were properly opened. Afterward, the effluvia (exhalation), with ten drops of laudanum, was exhibited every four hours.

On the following day the patient had some motion and was much better; but, as his sickness continued, he was ordered a grain of opium every four hours. About a week afterward, he complained of a great increase of pain, which was worse than before by a shaver. He was now completely prostrated, and he could keep awake, but the vomiting, pain, and sickness were great.

Two days afterward, a discussion was perceived in the abdomen, which, in a further week, became considerably distended with fluid. The patient now did not complain of much pain, but appeared to be making little or no progress was made in the swelling, and this first period what appeared to be pain had now subsided. The uric acid then was becoming regular, and the appetite good. In the third week, the operation was repeated, and fifteen grains of the same blood were drawn off. Nine days afterward, another puncture was made, and thirteen grains more let out, and all were discharged in twelve hours. From this period the leg swelled up well, and perfectly recovered under the use of light mercurial ointment. (*See Med. Clin. Trans. vol. 3, p. 300*.)

A previous anatomical section of the gall bladder to the peritoneum might also prevent the accumulation of bile and its dangerous effects. (*Gallies, Anat. Clin. Medica, t. 1, p. 18*.)

According to Dr. Bauman, a deep wound of the liver is as fatal as if the liver itself was exposed. The slightest injuries are mortal. He claims that the same symptoms of a wound of the liver are felt from it if the vital and some symptoms of the same nature occur, and great and dangerous tenderness of the liver. The discharge from the wound is generally yellow and glutinous, except sometimes in early cases, as mentioned above. (*The Military Surgeon, vol. 2, p. 228*.) For some other interesting observations on wounds of the liver, I refer your attention to the following: (*See also the Medical and Military Reports, Jan. 1855, and the Medical and Military Reports of the Medical and Military Surgeons in Belgium, See 1855*.)

8. *Wound*.—The kind of a very fluid nature, such as the bile, is extremely offensive to the abdomen, when the bladder is wounded at any point connected with the intestines. If it is the kind of case the liver is cut down off with a catheter, so as to prevent its extrusion, the patient soon perishes. Many anatomists are of the opinion of the bladder being removed even by a deep wound, which is very mortal.

Wounds of the bladder are attended with a discharge of bloody urine and difficulty of urinating. They are always dangerous cases, both on account of the risk of the effusion of or irritating a fluid in the abdomen, and of the chance of extrusion of the bladder into the cellular membrane. Under proper treatment, however, they often admit of cure. (*See Green's Med. Medica*.) If possible, the effort should be made to be discharged by a depending posture, at suitable punctures, or injections, and the extrusion of extravasation prevented by the use of a catheter, which is to be left in the urethra. The patient must not be allowed to urinate. As the tension and pain of the body, the constant attendance of a wounded bladder, they may be greatly relieved by the use of the warm bath (chloride, t. 1, p. 713), or rather immersions, which would not require the patient to be moved; exhibiting low diet, and other antispasmodic means, not being omitted.

Wounds of the bladder.—As Dr. Bauman has ob-

served, these cases are extremely dangerous, though not generally fatal. "Bauman, Percy calculating, that of twenty cases, five or six only have escaped; this, however, is a considerable average." Two cases of the wounds of the stomach are reported by Dr. Bauman. (*See also the Medical Reports in Belgium, &c.*) With respect to the chances of recovery, Dr. Bauman justly remarks, that the frequency of the bladder, Perizon (Dr. Bauman's *Colic*—*Perizon*, *Revue Méd. 1855*), and English "Colic" cases," in some of whom the kidneys have been cut out, and in others discharged spontaneously through the coats of the stomach and portions of the bladder, are very encouraging. In France, a silver fork was found, embedded three or four inches in the stomach, by Mr. Renault, of Rouen, in the department of the Orne, who performed gastrostomy for the purpose with complete success. (*See Quarterly Journal of Med. Sci. 15, p. 321*.) He has collected many instances of recovery, both from natural and artificial wounds of the stomach. (*See also the Medical Reports in Belgium, &c.*) But according to Dr. Bauman, the results in the articles "Ventricular" and "Perizon," have brought together the largest number of cases. Dr. Bauman refers to *Laennec's Abdomen of the Stomach*, vol. 6, p. 192, for instance, in which the stomach of a female was ruptured and sewed up, and the same practice extended in the female subject with success. It appears, also, from the *Journal de Médecine*, &c. t. 2, by Krieger, from Bauman's *Transplantation*, and the *Journal de Médecine*, &c. t. 2, p. 300, that wounds of the stomach have been attended with success in various cases of emergency. (*See Bauman's Military Surgeon, &c. p. 438*.) As the latter author observes, wounds of the stomach are not accompanied by hemorrhages, and remain open. In a case recorded by Bauman, the fluids contained upon them freely, and in a severe instance, noticed by Bauman, ten years. (*See Bauman's Medical Progress, &c. p. 330*.) And Weisley has detailed a case, in which the opening continued freely seven years. (*See Bauman's Medical Progress, &c. p. 330*.) For further information connected with this subject, the reader may also consult *Journal de Médecine*, &c. t. 2, p. 300, and *Journal de Médecine*, &c. t. 2, p. 300.

Wounds of the Intestines.—The rupture of blood in the large of it by itself; the escape of fluid also is of a fatal nature from the wounds of the stomach; any simple, compound, or a portion of blood, protruding at the opening in the skin, and the stomach is exposed to the risk of a wound of the liver. When the wound is exposed in the abdominal cavity, it is obvious to the surgeon's eye; but when it is about a part of the intestine, it is not within the abdomen, the danger of the case can be known only by a consideration of other symptoms. In addition to what I have already described, there are some others which ordinarily accompany wounds of the bowels; as, for instance, symptoms about the peritonitis, some or greater pain in the belly, some events, &c. But unless the wounded intestine protrude, there is no practical good in knowing whether the bowels are injured or not; since, if it be in the abdomen, the fluids are sought not to be removed from the body, and a simple penetrating wound of the bowels, attended with a wound of any of the viscera. Large wounds of the small intestine, particularly of the duodenum and jejunum, are attended with some fever, vomiting, pain, and the continuance of symptoms, cold prostration, a small, insensating, tremulous pulse, and they frequently prove fatal. Rupture of the small intestine may also occur when the rupture of the large intestine followed by extravasation. A fatal division of the upper part of the intestine (stomach), towards the pylorus, will deprive the body of the nourishment requisite for its support. If the chyle escape from the wound, the patient will die of a short duration; and if it become extravasated, it will be likely to cause such irritation as will prove fatal. The escape of extravasated or fluid from the wound, and cause an injury of some of the large intestines. In these cases, the symptoms are generally similar, and the passage of the intestinal contents towards, through the wound, may stop, or prevent of the bowels being irreparable. If the same wound, the wounded intestine may, finally contract, as indicated in the adjacent

(P. 124.) And among other observations, I find "marked dissension of a most distinct of the usual air, irregularity, and therefore certainly fatal!"—(P. 123.)

These differences do not appear to me satisfactorily explained. We are told, that exposure to a pure air, in fact, is, in theory, more beneficial to the lungs as compared to air, and that the absolute contact of the divided surfaces, at these extreme considerations, is requisite to secure the blood from the danger of additional coagulation. The foundation of these unqualified conclusions is two experiments made on dogs; in that of which experiments, the divided lower was brought together with one stick, on Mr. John Bell's plan, while, in another, three sticks were made; and yet, in all these instances the animals died with the purports of the lungs cleared. As for the inference, more established, that animals die, for their inability, however, Mr. Verres is completely afterwards proved to refute other experiments, instituted by Dr. Asch Cooper, Dr. Thompson, and Dr. Smith, which, though Mr. Traverser seems unaware of the fact, tend most completely to overturn the conclusions which he had been previously making.

Dr. A. Cooper repeated the experiments of Henslow, who had succeeded in saving, by suturing the divided surface of a dog, including in his position of the trachea a call. In place of the undivided surface, three distinct sticks were inserted. On the sixth or seventh day the animal was killed, and the union was complete.—(P. 123.)

There are two facts, proving that a wounded surface may be healed, though the suture was not such as to rejoin the divided surface, in contact in the whole of its circumference.

Dr. Asch Cooper then made the experiment, without including the foreign substance. The animal recovered, being a third that remains; it proves, that the absolute contact of every point of the ends of divided vessel is not essential to the cure.—(See Dr. Cooper on *Spinal and Crural Aneurysm*, Chap. 2.)

After dividing the trachea of a dog, Dr. John Thompson, of Mississippi, applied five interrupted stitches, at equal intervals, the ends of the trachea were cut off, and the external wound was closed with a suture. This animal did not die of the operation, and when he was afterwards killed, it appeared that the threads had made their way into the lumen of the tracheal canal. Dr. Thompson repeated this experiment, and did not die the animal all six weeks afterward, when the same tendency of ligaments to pass into the vessels and to this discharge was manifested.

These facts are made first in good that the absolute contact of every part of the ends of a divided vessel is not essential to perfect union, or the consequence of the wound from proving fatal, and several other experiments were made by Dr. Smith, at Philadelphia, who employed four stitches with similar success.

As far then as the supposition of such facts ought to have weight, we are bound to receive the conclusions of Mr. Traverser to be correct and unimpeachable. I am surprised that Mr. Traverser himself has not described the particulars of all these last experiments, did we possess that they struck directly at his own inference. They are not only completely arguments against Mr. Traverser's conclusion, that the union of a divided vessel requires the contact of the cut extremities in their entire circumference; but they are a plain denial of another position, advanced by this author, viz. that wounds extending to a direct division of the canal are irreparable, and therefore inevitably fatal.

With respect to the species of suture being of secondary importance, provided it rejoin the circumference of every part of the divided ends of the divided vessel, I repeat that Mr. Traverser has suggested to facilitate experiments, in order to prove that exposure nature can be practised, and if he has the humanity to apply it, whether his plan would be for or against the conclusion which he has formed. The fact of the suture always making their way into the cavity of the vessel, and being thus put in of, appears to me highly interesting, since it shows the ability of calling away the ends, instead of leaving them, forming out of the external wound, as so to create the most instant and interference of sutureless adhesions. It seems that Mr. Benjamin Bell had observed that the

ends of the ligaments away, and reducing the level of the suture into the adhesion, as he says, a substantial part of the circumference of the ligament was left in the cavity of the gap.—(*System of Surgery*, vol. 2, p. 126, ed. 7.) We have seen that the experiments of Dr. Thompson confirm the observation, and were instituted by Mr. Traverser to lead to the same conclusion.

According to the latter writer, the following is the process by which a divided vessel is healed when suture is employed. "It commences with the re-approximation of the contiguous mucous surfaces, produced by the contraction of a fluid vessel to that which was torn together the ends of a recent blood vessel, when exposed to contact." The adhesive inflammation, which comes down the external edge of the exposed coat, from the whole circumference is a thick layer of coagulable lymph is effused, so as to rejoin the wounded vessel. The action of the lymphatic fibres, being exposed to the external circulation, the sections mutually rejoin, by the action of the process of osmotic absorption. During this time the lymphatic vessels become occupied by white as the function is performed, and the internal opening with the fibrils attached to it, is completed by the next time.

The putrefaction at the point of the ligament, and then fall with its end. The ligament left by the operation is gradually healed up, but the upper and lower surfaces, so far as my observations can observe, do not become consolidated by granulation, within the intervals making the division permanent, it is only scars obliterated.—(*Traverser on Surgery*, p. 126.)

Notwithstanding I have carefully read all the experiments added by Mr. Traverser in favor of suturing a divided vessel in a very young animal, and in a few weeks recovered, of the advantage of such process, for instant already suggested. It is not with a person well to me, in which a better price is than, provided, I should slightly a single case, even with a small vessel, and a patient of the age. If the vessel were completely cut, I should have no objection to amputate it, and to expose by suture, in three stitches of the same kind. I would not Mr. Traverser, respecting the advantage of suturing the ends of the ligament instead of leaving them in the wound, so I believe he is right in regard to the conclusion, there is of the injured vessel, and in regard to the wound; and that the ends of the vessel, and that of no use in keeping the wound in the wound, they must be irreparable, and therefore fatal.

On referring, some of the foregoing observations, I would refer to the valuable writings of Dr. Cooper and those of Dr. Henslow. The treatment of the wound, in which I allude, being continued in the last volume of the *First Lines of Surgery*, and in the *Medical*. The only gratification (says Dr. Henslow) is that, such severe loss having no other result than the loss of a few inches of the vessel, although the patient's employment of suture ought to have been more than how much she could bear with impunity. The chances are very little doubt that their ability, provided, if not positively harmful. In the course of a case, extensive suture, was once only have some, and, of course, suture was required to a considerable length, though frequently it may be needed for the suture of the patient.—(*The Medical Surgery*, ed. 2, p. 411.)

When the protruded intestine was found, which was very rare occurrence, it was of course, no doubt, should be the same as that of a small intestine.—(*See Henslow*.)

As Dr. Henslow observes, in the treatment of wounds of the abdomen, the value of suture is to be maintained more by general means than by any of the surgical aids of surgery. The search for suture is being, in fact, especially in the case of the case, to be such a good, is entirely out of the question. Entailment of infection of the wound, as the case may require, for retaining protruded intestine, is a very serious matter, and promoting its return to the part, is all that the surgeon need do in the way of operation, and even in this the best is suture of the vessel.—(*On Medical Surgery*, ed. 2, p. 411.)

The principal indication is to prevent a dangerous degree of inflammation. Hence bleeding and the antiseptic characters are highly indicated. The

the surgeon be deterred from such practice by the apparent debility of the patient, his small, concentrated pulse, and the coldness of his extremities; symptoms common to severe inflammation of the bowels, and, in fact, themselves indicating the propriety of repeated venesection. Wounds of the small intestine are attended with more dangerous symptoms than those of the large ones. All diet, stimulants, and solid food is to be prohibited. The bowels are to be daily emptied with opium, by which means no matter will be suffered to accumulate in the intestinal canal, so as to excite inflammation and distension.

When extraneous matter is discharged from the outer wound, it is highly necessary to clean and dress the part very frequently. Gentle pressure should also be made with the finger, at the circumference of the wound, in order to apply the pressure of any extravasated matter. For the same reason the patient should always lie, if convenient, in a posture that will render the wound opening depending.

After a day or two the surgeon need not be afraid of letting the outer wound heal up; for the adhesive is, from its situation, at a distance from the course of the wound, will have passed any extravasation, either from haemorrhage diffused among the viscera. If the case should run well, the intestine gradually indurates a distention is its diameter in the place where the wound was situated. When this contraction is considerable, the patient occasionally experiences colic pains at the part, especially after eating solid food as tends to produce flatulence. As these pains usually go entirely off after a certain time, and to ineffectualness whatever remedy, the intestine may possibly regain its wonted capacity again. A more considerable contraction of the above sort has been known to occasion a fatal outcome. Even the intestine itself has been known to heal in this situation, after it contained food ascertained beyond the contracted part. Patients, when recovered from the wound in the intestine, should exercise and be particularly careful not to swallow any food substance, or indigestible dissolved food. On this subject the writings of Scarpa are particularly interesting.

In some instances intestinal matter continues to be discharged from the outer wound, either in part or entirely, so that either a fistula or an artificial anus is the consequence. A fistula is more apt to follow when an intestine has been injured by a ball, has been quite cut through, or has mortified. But numerous cases prove that this is not invariably the consequence, and that a perfect cure has frequently followed each of these occurrences.—(See *Acute, Artificial*.)

When inflammation is completely cut through, and the lower portion of the canal has successfully contracted in the abdomen, writers insist upon the necessity of preserving the formation of an artificial anus. In this particular case they recommend filling the extremity of the intestine with a fine suture in the edge of the outer wound. In order to distinguish the upper end of the intestine from the lower, the proposal is sometimes made to give the patient a little wine, and to observe whether the fluid, after a time, issues from the mouth of the protruded gut. In the mean while fumigations are employed. If the upper end of the intestine be in the abdomen, these fumigations seldom even form a junction, when the excision is quite recent, to dilate the outer wound, means for the better continuation of the bowel, and then are the two ends right.

Practical surgeons, however, are right in withholding life support in such situations.—Indeed says a modern writer, the surgeon would have long since discovered their fears about the intestine falling upwards, and about the difficulties of distinguishing between the right and the wrong end of it. The operations of abdominal effusions are fearful pretty well settled. The reference is extremely rare, and when it does happen, we leave the poor wretch to die in pain, without searching after effused fluids, the nature of which cannot be known, or, if known, the inflammation caused, in the most remote degree, lead to recovery. I have never witnessed a case where any possible good effect could follow the paracentesis in peritonitis, it is more expedient then, has always preceded the symptoms, which would lead to the performance of that operation.—(Hewson on Military Surgery, vol. 2, p. 411.)

In some instances matter falls into the abdo-

men, lodge there a considerable time, and are then washed through the intestinal canal; while in other instances they become organized, and continue lodged the rest of the patient's life, without producing much, or indeed any inconvenience.

Gasotomies and other injuries of the abdomen.—A violent contusion of the abdomen may happen in contused wounds, without the occurrence of any external wound. It was in this way that the liver or gall bladder was ruptured in the way mentioned by Mr. Potts (Med. Chir. Trans. vol. 4); and thus the virus was introduced in the case which fell under the observation of Richman, where a man whilst passing a child's belly.—(Necropsy Chap. I. N. p. 385.) In other instances the violence is done to the intestines, and still more frequently to the viscera, as well as the parietes of the abdomen, have only suffered a shock or been bruised externally. The effects of such violence are inflammation of the injured viscera, and their adhesion to the walls of the peritoneum. Then, the stomach and intestines, the liver, and the gall bladder, when detached from a focus upon the front of the belly, come in contact with the corresponding portion of the parietes, which has been also bruised, and is thus inflamed. When such inflammation suppurates and, according to Richman, it is their most usual course, opening the abdomen, the pus is found blended with the matter which the viscera contain elsewhere. Thus the alimentary canal, and even intestinal contents, have been discharged with the pus on opening, contain a mass which communicated with the cavity of the stomach or bowels, and has been found blended with the matter of abscesses in the right hypochondrium.

When, in consequence of a blow upon the anterior part of the belly, the patient experiences the situation of the injury a deeply-seated pain; when a tumour forms, and the symptoms indicate violence done to some of the abdominal viscera, the inflammation is to be opposed by every possible antiphlogistic means. But when, notwithstanding such treatment, the swelling increases and suppurates, the abscess is not to be opened until it is perfectly mature. The inflammatory symptoms, which precede its formation, indicate that there is an adhesion between the injured organ and the parietes of the abdomen. Without this adhesion, opening the abscess would be attended with more harm, because the pus or other matter might become extravasated in the cavity of the peritoneum. For the same reason, in the examples of tumors caused by life in the gall bladder, J. L. Pott recommends deferring the operation of opening them, until the inflammatory symptoms evince that an adhesion has taken place between the fundus of the gall bladder and the corresponding point of the parietes of the abdomen.

An abscess of the abdominal viscera to the inner surface of the peritoneum may be induced by other causes besides the action of cooling bodies. A knife, a fork, a shoemaker's awl, a needle, and other extraneous substances incapable of passing through the alimentary canal, have been known to irritate the stomach or bowels, and to bring on adhesion of them to the parietes of the abdomen, where a burrow has formed, which, on being opened, has discharged the foreign body. The records of surgery abound in facts of this kind. A fistula records the opening of the abscess, the alimentary matter escapes, and, if the aperture itself had not been healed by methodical compression, the intestine, canal between the bowels and the anus remains; most of the contents of the bowels pass out at the preternatural opening, and the patient falls into a state of inanition, the anus gradually fatal, the greater the injury of the intestinal canal, it is the sicker.

A long-continued pressure on the epigastric region may cause an adhesion of the stomach to the parietes, and suppuration taking place at the part, a fistula, communicating with the cavity of that organ, is formed, and allow the contents to escape externally.—(See *Histology, Physiology, &c. of the Digestive System*, Chap. 2, p. 323-326, edit. 4.)

I shall conclude with repeating, that in the proximity of rupture of the abdomen from internal violence, of rupture of the stomach or colon, the principal danger whether towards or contraindication of the peritoneum, in depends upon inflammation of the peritoneum. In the treatment, therefore the most necessary thing is to

rated, Mr. R. Bell conceived that it was attended with hazard of wounding the large blood-vessels. Although it seems to me better to use a vaso-vital history, it is a difference than the kind of reason which Mr. Sharp employed, I do not coincide with Mr. R. Bell in thinking that the latter surgeon's plan was at all objectionable, or the source of danger in respect to wounding the vessels. Some practitioners may even think Mr. R. Bell's method most likely to injure the large vessels; for he advises the operator to cut the muscle five or six gradually towards, as deeply as necessary.

Perhaps the most modest method of operating, is to divide the vertical portion of the contracted muscle near the clavicle, and even to cut out a sufficient piece to remove all chance of the two ends uniting again. This may weaken the muscle considerably, and perhaps might answer every purpose. It might easily be accomplished by means of a director and curved bistoury, after making the requisite division of the skin with a common scalpel. Were this proceeding to produce only partial anastomosis, the normal portion of the muscle might afterward be divided. A director should be passed under it, and the division made with a probe-pointed curved bistoury. In operating on a female patient, it might be advisable, with the view of avoiding a large scar, to make only a puncture, and pass the knife *dissecto-wards* and close behind the vertical portion of the muscle, the posterior part of which could be divided by then turning the edge of the instrument *verso-wards*. In this manner, Dupuytren operated successfully in one instance.—(*See Quarterly Journal of Foreign Med. etc.* 20, p. 532.)

Any cause destroying the equilibrium between the sterno-clide-mammaric muscles, will produce a wry-neck. Thus, when one of them is affected with spasm, and acts more forcibly than the other, it draws the head towards the shoulder of its own side; but when one sterno-clide-mammaric is paralyzed, while the other retains only its natural power, the balance of action is equally destroyed, and the head is inclined the head towards the opposite shoulder. In paralytic cases, electricity (Phil. Trans., vol. 68, p. 52; Gally in *London Med. Journ.*, vol. 4, 1799; Wilson, stimulating liniments, the shower-bath, sea-bathing, warm, arsenic, the application of moxa, and anæsthesia to the health in general, are the means affording the best chances of relief.

Although the dry-season sometimes depends on the state of the storm-cloud-mountainous weather, it is frequently owing to a sheering of the isotherms. Local winds successfully divided contractions of the air, which had kept the local dryer to one side for many years, and had been connected by lanes. Some of these contractions, the size, might easily have been mistaken for a part of the storm-cloud-mountainous itself.

Mr. Gooch relates a case of very much, which was caused by a contraction of the platysma myoides muscle. The patient was a young gentleman fourteen years of age, who had always enjoyed very good health in every other respect. For several months the head had been strongly drawn to one side by a constant contraction of the platysma myoides muscle, which was exceedingly rapid, especially about its insertion at the base of the jaw; and from the angle of the os maxillare inferior to the chin the skin presented an appearance like that of the skin of a lion. The same side of the face, quite from the point of the chin, was much shrunk and distorted by the contraction of the zygomatic, and the corner of the mouth in particular was so drawn to one side and downwards when the patient closed his head, that a vast deal of deformity was the consequence. From the inferior part of the eyebrow, at the internal angle of the eye to near the tip of the nose, there was a kind of furrow upon the skin about half an inch broad, with a shining, polished appearance, like the process of a wound, and devoid of hair, which had fallen off. From the corner of the eye downwards, there was the same kind of appearance in a less degree. The patient was subjected to repeated attacks of spasms, which began at the insertion of the muscle, and terminated at the eye, attended with a prodigious pain. The ear, and also the temporal and frontal muscles, were sometimes affected in a similar manner. The parts in the course of the insertion of the muscle into the jawbone, were considerably thickened, without being in the least inflamed.

externally, and when bunched, but not stretched, they were quite painful. The subjacent muscles did not seem at all affected.

It appears from the account given by Mr. Goodrich, that in the treatment of this affection, *crura* *anagae* muscles had been used, by the advice of the best em-
pirical practitioners; but without effect. Mr. Goodrich
attributed to my visit benefit would be produced by ex-
tension of the muscle. He first divided the lateral
muscle a little below the joint, and then exposed the
whole breadth of the *genua* *anagae* muscle, the
fibres of which seemed to be in a state of violent ex-
tension, especially when the patient's limb was in-
tended towards the opposite side. Mr. Goodrich then
divided the muscle completely across, in a very careful
direction, until the fibres of the *anagae* *anagae* muscles
were exposed. The patient was then directed to turn
his limb towards the opposite side, and Mr. Goodrich had
the satisfaction of observing, that the patient could
perform this motion, without the least degree of the
muscle being affected, as they lay perfectly to be.
The wound was treated in the ordinary way, and no
particular symptoms arose. As soon as the inflam-
mation had subsided, the patient was directed to
perform the same motion, in order to prevent any
kind of stiffness which might arise from the con-
striction of the muscular fibres, and the elasticity of
the tissue.

The patient was perfectly relieved by the foregoing operation, and had no return of the painful spasms, to which he had been previously subject. The side of his face, however, never resumed its proper degree of distension.—*Chir. Med.*, vol. 8, *Case*, &c.

have lately seen an elderly gentleman, who is afflicted with a varicocoe, for which several of the most eminent surgeons have been consulted; but they have not advised an operation, nor have any of their prescriptions been of service. The case is complicated with a constant tremulous motion of the testis, and great weakness and indolence of the upper extremities, so that the patient cannot get a glass or cup to his mouth, without using both hands for the purpose.

Whenever an attempt is made to cure a very thick, by dividing any of the sinuities, or merely the integuments, it becomes necessary to take special measures for keeping the head in a proper position, during the treatment of the abscess; first, in consequence of the head inclining in the direction in which it was before the operation, the divided parts should grow together again, and bring the patient into the same condition in which he was before any thing had been done. With a view of preventing this unpleasant circumstance, Mr. Simpson recommends fitting the wound with flax, and making it suppurate. Mr. R. Bell, on the other hand, advises the employment of a proper machine for keeping the head in a due position. Some writers make the use of a bandage sufficient for the purpose. In Bagnard's case, the cut edges of the muscle were kept together by depressing the scapula, and inclining the head to the opposite side. The first object was fulfilled by bowing the hand on the same side as the operation firmly to the face, the lower being bent; the last, by means of a roller applied round the head, and under the scapula the opposite side.—(*See Quarterly Journal of Farquhar* (Vol. II. 20. p. 423.) Sometimes, the removal of a great portion of the affected muscle is up to extremity in the operation.

Boys met with a paraisis of the extensor muscles of the hand, attended with a downward approximation of the skin to the stumps. Two cases related every point of treatment, and an apparatus for supporting the hand was the only thing tested of any use.—*Ann. du Mus. Nat. Hist. Nat.*, t. 7, p. 81, Paris, 1803.

Stump's Position in the Operations of Surgery, chap. V. Blunt, *Obs. Med. Rec.* p. 2, No. 1, not effaced by operation. Alcock, *De Capite Hæmorrh. Feb.* 1772. *Chirurg. Works of D. Gual.* vol. 2, p. 81.

R. Balf's System of Surgery. *Amsterdam, Hæderson, t. 1, No. 32 and 33; successful operation.* *Encyclopædie Méthodique, partie Chirurgicale*, t. 2, art. Tournement. *Art. Chien. Transp. Morg.* when the Forceps continuus for Amputation Surgery, and the continuus and entire Patient directed. *Leipzig*, 1818. The apparatus apparatus recommended by this author is described and referred to in—*First Lines of the Practice of Surgery*, ed. 5. *Barnes Rec.* *Trans. Am. Med. Soc.* t. 5, p. 45, *Am. Med. Soc.*, 1823.

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ZIN

ZINC. The preparations of this metal are of considerable use in surgery. With respect to the sulphate of zinc, it may be said to be generally the best remedy in cases where it is desirable to keep the skin moist without the least drying, as in cases of poisoning for which purpose, the common dose is ʒj. As an external application, this salt dissolved in rose water, in the proportion of gr. iiii. to ʒj. of rose water, serves as a perfect collyrium in the latter stage of ophthalmia, after the inflammatory action has subsided: it is a good injection in the earlier stage of gonorrhoea, and is useful in some kinds of superficial inflammation. Of double strength, this solution is the best application

that can be used in scrofulous sores, after they have suppurated, and the abscess has been discharged.—*Ed. V. Thomson, London Dispensatory, vol. 2, p. 269.* A simple ointment of zinc is often serviceable for abatement of the itching, hæmorrhoids, or itching of the Zæni ulcers. ʒj. Aq. roseæ ʒvj. (Galenus 3). M. ii. gargle with frequent strains. The sapientia ointment, composed of an ounce of the oil of fish, and six ounces of prepared lard is a good ointment, highly stimulant, drying, and is frequently employed in various cutaneous diseases, eruptions, sore nipples, and chronic inflammation of the scapularia of the eyelids.

SUPPLEMENTARY APPENDIX

TO THE

SURGICAL DICTIONARY

OF

SAMUEL COOPER,

EMBRACING ALL THE VALUABLE IMPROVEMENTS OF THE SEVENTH AND
LATEST EDITION OF THE AUTHOR, PUBLISHED IN 1838,

TOGETHER WITH

ALL THE RECENT IMPROVEMENTS IN EUROPE SINCE THAT DATE, AND A REC-
ORD OF THE REMARKABLE OPERATIONS PERFORMED BY

AMERICAN SURGEONS

IN VARIOUS PARTS OF THE UNITED STATES; THUS BRINGING THE
SCIENCE DOWN TO THE PRESENT TIME.

BY DAVID MEREDITH REESE, A.M., M.D.,

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The additional notes heretofore found in the Supplementary Appendix in former American editions, are now inserted in their alphabetical order with the matter of the Appendix in the present new American edition.

PREFACE.

IN the article "Surgery" in the former edition of this Dictionary, and which, from the necessity of the case, is still retained in the text, it will be seen that, actuated by a national feeling, which will be appreciated by every American, I complained of the omission of the just claims and sterling merits in this department to which the surgeons of the United States were entitled, and attempted, in my notes, to supply the author's lack of service. Mr. Cooper has responded in a manner so creditable to himself, and to the liberal profession of which he is a veteran, that in justice to him I here insert his response. In the preface to his last London edition, 1838, he says,

"In particular, it affords me peculiar gratification to have had an opportunity, in this seventh edition, of bringing under the notice of British surgeons the meritorious transactions of their brethren in the United States, where the same zeal for the advancement of Surgery, and the same just estimate of its value to society, are exemplified as in the mother-country. In Operative Surgery, the surgeons of no nation have exceeded them in decision, coolness, enterprise, and boldness; and however doubtful I may individually be respecting the real good likely, on the whole, to result to mankind from certain extraordinary achievements with the scalpel, which, as will be seen in the course of this work, have been performed in America, I give the surgeons of the United States, as I do to many surgeons in my own country, France, and Germany, who are smitten with the love of similar proceedings, the credit of being actuated by the zealous hope of being able, by such means, to extend the efficiency of Surgery to cases of the most desperate kind."

"This edition will not only be the means of diffusing the knowledge of what has been done in operative and other parts of Surgery by European and American surgeons, but it will prove that, however right Dr. Reese may have been in complaining of my not having formerly done full justice to the surgeons of the United States, it was not from any desire on my part to keep their transactions concealed, but simply from the fact that I did not then possess the information that has since reached me of their praiseworthy exertions."

Under the article "Jaw-bones, amputation of," he thus speaks:

"The operation of removing a considerable portion of the lower jaw-bone is stated by Dr. Reese to have been first performed by Dr. Valentine Mott. This claim I was not aware of at the time when the article *Bones, Excision of*, was delivered to the printer, nor have I, at the present moment, leisure to ascertain the point. 'Dr. Mott is not only the first,' says Dr. Reese, 'but the only surgeon who has amputated the bone successfully at the articulation, except (since) Dr. Chasack of Dublin.' (See Amer. ed. of this Dict.)"

"I am very glad to have had this opportunity of recording the claim of Dr. Valentine Mott to the merit of having first removed the lower jaw at the articulation. The achievements of this distinguished surgeon, to whom I had the gratification of being introduced when he lately visited University College Hospital, I shall always be as proud of noticing as if they were the performances of any British practitioner."

And appended to the article "Surgery" I find the following frank and manly paragraph:

"I regret that, in the last edition, due justice was not done to the meritorious surgeons of the United States of America. This happened, however, not from any want of desire on my part to pay the tribute of honour where it was deserved, but from my not being then in possession of the valuable information respecting the progress of Surgery in the United States, which I have since obtained from Dr. Reese's American edition of this Dictionary, and other sources. I most cordially join, then, in the observation that, in a history of this kind, mention ought to be made of 'the names of Drs. White, Dudley, Davidge, Dorsey, Shippen, Bard, Post, Mott, Gibson, Parrish, Barnes, McClellan, Stearns, Warren, Smith, Jamieson, and a host of others, who have contributed by the pen and the knife to elevate this department of the profession: this will be admitted, unless the successful ligature of the subclavia, the common iliac, the internal iliac, and that of the innominate, the amputation of the hip-joint, and upper and lower jaw, the extirpation of the parotid gland, the excision of the clavicle, and the cure of aneurism, by tying on the distal side of the tumour, be unworthy of record. Some of these operations,' continues Dr. Reese, 'had never been attempted in Europe till our surgeons had led the way; and by these, and other splendid achievements in Operative Surgery, had demonstrated their practicability and success.' In alluding to such merit in the surgeons of the United States, I feel all that heartish pleasure which arises from the remembrance of their close connexion with my native country by the ties of blood and language, and they may rest assured of my sincere esteem, and of my earnest wish to render full justice to them on every subject."

It is a source of gratification to me that my humble effort has been successful in acquainting our professional brethren in Europe with the real merits of my own countrymen, so many of whom have distinguished themselves by their exertions in behalf of science and humanity, and whose meritorious claims in surgery have never before been recognised or acknowledged. Mr. Cooper has, in this seventh edition of his work, incorporated all my numerous notes and additions on American Surgery, so that our national pretensions are now spread before the profession in Great Britain. A similar mood of justice has also been since awarded us in France; for in the second edition of Velpeau's "*Nouveaux Elements de Medecin Operatoire*," the author has manifested a commendable spirit of liberality and justice to American surgery which does him honour.

The following extract of a letter lately received from the venerable author of this Dictionary, addressed to the American editor of his work, will be gratifying to the profession, and its insertion here is due to Mr. Cooper.

"Woburn Place, Russell Square, London.

"I am glad to hear that you are about to undertake another American edition of the Dictionary of Practical Surgery, for you acquitted yourself so ably in the editorship of the former one, that not a doubt can be entertained about your very superior qualifications for the task. I know that numerous valuable observations and improvements in Surgery have been made in Europe and America subsequently to the publication of your first edition, and especially since the year 1830, when your notes were written. Perhaps in the last ten years, I may say with truth that Surgery has made greater progress than in any preceding space of time of the same length; hence there must be a necessity for much change in every general treatise on the subject, in order to

adapt it to the present state of the science, and to let it give a correct explanation of the theory and practice most approved of in those parts of the world where our noble profession is cultivated with the greatest degree of success. These remarks are especially applicable to the Dictionary of Surgery, which embraces the whole range of the subject, and, perhaps, has a more extensive circulation than any other book devoted to it. Into your new edition you will be able to bring not only all the new matter brought into my last edition, but other observations and improvements made by the talented surgeons of the United States, and either not known to me, or not within my reach at the period when I was writing. Whenever I arrive at a new edition again, your testimonials of the contributions of your distinguished countrymen will not be overlooked, and every endeavour will be made to do them justice. Believe me that I shall be most happy to shake hands with you in London, and that I am most faithfully yours,

SAMUEL COOPER.

"Professor Reese, New-York."

In the present Appendix, which is all that I am enabled to add in issuing the new edition, my aim has been to avail myself of the new matter furnished by Mr. Cooper concerning transatlantic Surgery, and at the same time exhibit the improvements in Surgery which have been made in the Old and in the New World since his latest edition, which, it will be seen, are neither few nor inconsiderable. To name but a single example, the entire specialty of Orthopædic Surgery has been added, this department having but dawned when that edition was issued. And, moreover, by attempting the record of the achievements of American surgeons, especially since my last edition in 1830, I have endeavoured to bring down the science of Surgery to the present date. My limited space has imposed the necessity of greater condensation than is consistent with good taste, and in some cases may have prevented me from doing full justice to the individuals concerned. Indeed, if I could have had greater space for amplification on some topics, the performance of my task would have been much more agreeable to my own inclinations. Under the circumstances, however, I have done what I could, and trust that the candour of my professional brethren will award me all that I claim, a disposition to do equal and exact justice to all, and to exhibit the individual claims of American surgeons with impartiality and truth.

THE AMERICAN EDITOR.

P.S. The most important improvements of Mr. Cooper's last edition, including new articles superadded and old ones rewritten, have been inserted entire in this Appendix, as well as a summary of everything which he has furnished either recent or valuable in transatlantic Surgery. All such improvements will be found designated by being included in brackets, with the initials of the author appended.

K K



SUPPLEMENT.

ABDOMEN.

[**ABDOMEN.** **THE BELLY.** If the pelvis be reckoned as part of the abdomen, the latter may be said to extend from the diaphragm, which forms its upper boundary, down to the levatores ani, and from the transverse muscles in front, to the spine, quadratus lumborum, and iliac crest behind. Thus comprehensively viewed, the abdomen appears to contain and protect all the organs of digestion situated below the oesophagus, together with the urinary and internal organs of generation.

The epigastric region contains the middle part and the pyloric extremity of the stomach, the left lobe of the liver, the hepatic vessels, the lobulus papillæ, the pancreas, the celiac axis, the renal ganglia, the aorta, the vena cava, and the crura of the diaphragm. The left hypochondrium contains the large end of the stomach, the spleen and narrow extremity of the pancreas, part of the colon, the renal capsule, and the upper portion of the kidney. The right hypochondrium contains the right lobe of the liver, the gall-bladder, part of the stomach, some of the ascending colon, the renal capsule, and upper portion of the kidney. The right lumbar region contains the ascending colon, the lower half of the kidney, and part of the jejunum. The left contains the ascending colon, the lower half of the kidney, and part of the jejunum. In the hypogastric region are the convolutions of the ileum, the bladder in children, and in adults both the bladder and the uterus, if distended. The right iliac fossa contains the caecum, the iliac, and spermatic vessels, and the left iliac fossa the sigmoid flexure of the colon, the ureter, and the spermatic vessels.

Although the upper boundaries of the abdomen are completely bounded internally by the diaphragm, they remain quite undefined externally. The diaphragm being a movable partition between the chest and abdomen, alternately ascending and descending in respiration, and by such changes have the effect of communicating a corresponding enlargement or diminution of one of these cavities at the expense of the other. Without attention to this fact, mistakes in diagnosis would be very frequent. A vessel, entering at the same point and in the same direction, may penetrate the thorax, or the abdomen, or both cavities, according to the position of the diaphragm at the moment of the injury.

The functions of the abdomen essentially require that its capacity should be continually varying; and had its cavity been circumscribed by an unyielding case, like that of the cranium, or by a construction like that of the parietes of the chest, such an arrangement would have been totally incompatible with the offices of the abdominal viscera. So circumscribed is Cruveilhier of the facility with which the plexus accommodates itself to the varying quantity of its contents, that he regards the doctrine as perfectly erroneous which relates the irreducible state of some hernia to insufficiency of space within the peritoneum.

ABDOMEN.

"What!" says he; "can we suppose a cavity incapable of receiving the bowels again, which will allow of eight or ten paroxysms of vomiting and drink being suddenly introduced into it? and which, as tympanites, often becomes distended in a short time to twice or thrice its natural dimensions?" According to the judgment of this distinguished pathologist, the obstacle to reduction depends either upon adhesions, or a disproportion between the viscera and the passage through which they protrude, arising from hypertrophy of the stricture or mesentery, or the altered relations of the peritoneum drawn down by the distended intestines. But, though this explanation, so far as it goes, seems correct with reference to the causes of the impossibility of reduction, Cruveilhier's view should not lead us to forget that certain cases every now and then present themselves where the viscera admit of reduction; but their return into the abdomen is followed by so much pain and indisposition, that the plan of keeping them there is unconditionally resigned.

In the treatment of several diseases and injuries of the abdomen, the surgeon cannot proceed one step with safety to his patient without the light of anatomy. Hernia, wounds, punctations, abscesses are all so many cases where a surgeon deficient in anatomical knowledge would be likely to adopt very inefficient measures, or commit the most fatal mistakes. A surgeon acquainted with the structure and extent of the sheath of the perineum would have no difficulty in selecting the most advantageous place for the puncture, when matter collects within that investment of the muscle, and the practitioner, aware of the exact course of the epigastric artery, would never run any risk of wounding it either in tapping a dropsical patient, attempting to take up the external iliac artery, or dressing the stricture in inguinal and crural hernia.

On being first consulted, surgeons, as well as physicians, too often neglect to institute a careful examination of the external parts of the body. Thus, either from carelessness or mistaken delicacy, they deprive themselves of the most simple, ready, and sure means of recognising the nature of the patient's complaint. Some diseases of the chest and abdomen are strikingly expressed on the surface; either in a permanent change of configuration, or in a temporary alteration of the normal movements, or both. (*Præcis, in Capite, of Pract. Med., art. Abdomen, Exploration of.*) When obstinate constipation, great pain, tenderness, and vomiting occur, let the surgeon always be sure that these symptoms are not dependent upon hernia, the usual situations of which should be carefully explored. The methods of exploring the abdominal regions are three, viz., inspection, manual examination, or palpation, as it is termed, and percussion. The assistance of the sight and touch alone is not what the practitioner should always be content with; for as there is more or

lives grow within the alimentary canal, and considerable arterial trunks perrade the abdomen, the sense of bearing may be exercised with as much success in the investigation of diseases of this part of the body, as in that of diseases of the chest. The parietes of the abdomen being capable of relaxation, the viscera may be felt directly through them; and, as Cruveilhier justly remarks, this is the only visceral cavity admitting of such exploration. Frequently, by means of palpation, tender, enlarged, or indurated points may be detected. In the first instance, however, a careful inspection of the surface of the abdomen should always be made. The practitioner should consider whether it is more bulky or of less size than natural. Swelling and tenderness, combined with pain, and a small, frequent pulse, characterize acute peritonitis. In some cases, a circumscribed swelling points out the seat of the disease—the organ affected. How essential the knowledge of the various regions of the abdomen, and of the contents of each of them, will here be for the formation of a correct opinion, need be sufficiently manifest. In pregnancy, retention of urine, and enlarged drupe, the swelling has an oval or protuberant form; in leucos, a broader, more expanded shape. In lead colic, the parietes of the abdomen seem retracted, or drawn inward. When palpation is instituted, the abdominal muscles should be relaxed, and the patient's mind diverted from his case. The pressure should be made gently and gradually; for when it is too forcible and abrupt, the examiner's touch is perjured, the patient is put to pain and his muscles contract. According to Cruveilhier, it has even been known to occasion the death of children by lacerating the liver, or the spleen in a state of enlargement. In fact, this rule made of palpation conveys to the surgeon no information which can be relied upon; for the tenderness, or pain experienced, or the change of countenance, may be more owing to the readiness or force of the pressure, than to any disease in the region of the abdomen subjected to examination. In certain cases, like ascites, the exploration should be made, if possible, while the patient is standing up, because in this position the fluid gravitates, and renders the parietes of the abdomen taut, so that the fluid is more plainly distinguished.

The presence of gas or liquids may be detected by percussion; that of liquids, or any foreign body, being made manifest by the dull, dead sound, and the perception of fluctuation by the hand applied to the point opposite that which receives the percussion.

In diseases and injuries of the abdomen, the diagnosis is often attended with considerable obscurity. It might be supposed, that as the soft and yielding parietes of this cavity facilitate the manual examination of its viscera, the detection of any painful point about them, and the slightest change of their shape or volume, nothing would be more easy than to trace disease in this part of the body through its different stages with great precision. But, as Cruveilhier remarks, this is far from being the fact. The vast number of organs contained in the abdomen, their great mobility, the frequency of their displacement, the multitude of their diseases, the tortuous character of their vitality, which sometimes less than attain a very serious state of disease, undisturbed by any violent pain; and, lastly, the difference of thickness of the parietes of the abdomen in different individuals, are undoubtedly the circum-

stances accounting for the frequent difficulty in the diagnosis. In surgical as well as in medical cases, the same uncertainty is experienced. Thus punctured wounds of the abdomen are treated on general principles, because the practitioner seldom knows exactly what viscera are injured. The same observation is applicable to contusions of the abdomen. A man who had a hemia received the kick of a mule on the belly; severe colic and vomiting ensued; several surgeons believed that these symptoms arose from the hemia being stimulated, and recommended an operation. Cruveilhier objected to this proposal, which, however, was carried into execution; the patient died, and on opening the body, the small intestine was found torn completely across. In the North London Hospital, a young man died this spring (1836) from the kick of a horse on the abdomen. During the four or five days which he lived after the accident, he frequently vomited, and the belly became considerably swollen. Effusion of blood or of the intestinal contents was feared; but until the post-mortem examination took place, the exact nature of the injury remained doubtful. A dissection of the small intestines was then directed, supplied with effusion of its contents. The result was peritoneal inflammation.

Dr. Serravallo, in his work on *Diseases of the Ovary*, relates the case of a young woman, who, after suffering better fever, the course of which was not unquiet, suddenly complained of some pain in the abdomen, and in a few hours expired. On opening the body, a large quantity of pus was found effused in the peritoneal cavity, in an abscess of the right ovary. Dr. Trevisan, with an ovarian abscess of the size of an orange, whose the prominent symptoms were uncontrollable vomiting and synchysis fever. (*Cases of Pract. Med.*, art. *Abscess*.) I have seen several instances of ovarian cysts which had become inflamed after tapping, and secreted a purulent fluid. A woman had an ovarian tumour supposed to be an ovarian drupe. After death the cyst was found to contain twenty parts of well-formed pus. (*North Amer. Med. Jour.*, 1836.)

In one case an abscess communicated with the coccyx, to which, and the parietes of the abdomen the osseum had become firmly adherent. In this manner a circumscriptum abscess was formed, containing ill-conditioned pus, and three or four seeds of fruit, covered by cartilaginous crusts. (*Abdomen on Dis. of the Abdom.*, &c., p. 284.)

Abscesses of the liver are more common in hot than temperate climates. Frequently the liver becomes adherent to the neighbouring parts, and then the matter may be discharged through the parietes of the abdomen, or into the colon, stomach, duodenum, or gall-bladder; from which latter the pus may descend by the biliary duct into the intestine, and be discharged per anum, an instance of which is recorded by Mayhew. Abscesses of the liver have been known to make their way through the diaphragm into the pleura, or into the air-cells of the lungs, so that the pus was coughed up. Atrial refers to one case, where an abscess of the liver communicated with the vena cava, and to another, where it burst into the pericardium. (*Anat. Pathol.*, t. ii., p. 601.) At the request of the late Dr. Pinckard, I examined the body of a woman, in whose liver there were nearly three parts of pus; the case was remarkable on account of the gall-bladder having been inflamed, with the exception of a

trical portion of its fundus, which is now in my possession.

The kidney may be the seat of acute or chronic abscess. Sometimes the quantity of matter is small, and the texture of the organ but little changed. In other examples, the suppuration may be so rapid that some of the cellular structure of the kidney is lost, excepting its capsular investment, which is expanded into a cyst of considerable size, and filled with pus. I attended with Mr. Baker, of Sturges, an old man, who had symptoms somewhat like those of stone, and one of whose kidneys was found, after death, converted into a cyst containing about a pint of purulent fluid. As Anstie observes, renal abscesses are sometimes so large that they may be felt through the parietes of the abdomen. (*Lancet*, 1860, p. 633.)

Abscesses of the kidney may burst in the loin, or sink their way into the peritoneum, the ureter, or the calyx.

Mr. Lawson, of Lexington, sent me the parietes of a tube where the pulsations of the aorta against a diseased liver, extending across the epigastrium, and occasioning a well-defined tumour at the pit of the stomach, had been mistaken for an aneurism of the aorta, which vessel was found perfectly sound after death.

I once visited with Mr. Miller, of Keppel-street, a thin old man for retention of urine, when the tumour, formed by distended bladder above the pubes, was attended with rigidity and strong pulsations, corresponding to those of the aorta.

I was attended with the late Mr. Estlin on a boy in Christy Hospital, who had a considerable abscess in the lumbar region, attended with distinct but feeble pulsations, corresponding to those of the aorta.

Three or four years ago I was also consulted by Mr. Gilchrist, of Ephraim, in a case where an enormous abscess in the epigastric region was accompanied by pulsations as strong and synchronous with those of the heart as the throbbings of an aortic aneurism.—C.]

[ABSCESS (from the Latin *abscessus*). A collection of purulent fluid in the texture or substance of any part of the body capable of suppuration. If the pus is not within the tissue, but merely poured out into some regular and natural cavity of the body, where it forms an accumulation, the case is said to be one of purulent effusion, or of suppuration in the particular cavity affected, whether lined by a mucous, a synovial, or a serous membrane. When, however, the purulent matter is inclosed by a various membrane, where it follows any surface, passage, or duct, from which it is promptly voided externally, without producing any accumulation, the patient is said to have a purulent discharge. Familiar examples of this are seen in gonorrhoea and purulent ophthalmia.

When purulent matter is confined, and not infiltrated through the structure of an organ, it constitutes an abscess, the boundary of which is formed either by the tissue of the organ itself, or by what is termed an accidental tissue. In both cases, the formation of the boundary is accomplished by the affinity of contiguous lymph, which in the former produces the mass and constitution of the tissues of the organ in immediate contact with the pus, and thus prevents its diffusion; in the latter it forms a more or less perfect membrane over the whole of the surface over which the purulent secretion has taken

place; and hence the pus being excluded, as in a shut ear, the abscess is sometimes said to be incapsulated.

The cysts of abscesses have the power of absorption. In this manner, the occasional expansion and retraction of its diaphragm, without either tearing or being opened, is accounted for. The cysts must evidently be also secreting surfaces; for, after the pus has been discharged, the cavity is soon filled with purulent fluid again.

Abscesses cannot be produced in certain textures. Thus, they cannot take place in the dense structure of fibrous or cartilaginous tissues, nor in that of serous membranes. When pus is discharged from these tissues, it is effused either upon their surface, or into the cavities which they invest, but abscess never forms in their proper substance. It is the prevailing doctrine, that abscess can take place only in parts into which cellular tissue enters as one of their constituents; and that this tissue is more frequently the seat of abscess than any other. John Hunter explained that abscess is more common in superficial than deep-seated cellular tissue.

For an account of the tendency of abscesses to make their way to the surface of the body, or into a passage lined by mucous membrane; the theory of suppuration; qualities of pus; the general symptoms and treatment of abscesses; and other topics relating to this interesting subject, see SUPPURATION.

It is a contested point whether an abscess can ever take place unpreceded by inflammation. Although John Hunter has a section in his work on the blood, entitled "Collection of Matter without inflammation," yet his doctrines are decidedly in favour of suppuration being an effect of inflammation. At the present day, I believe the best pathologists would mostly concur on this point with Hunter. Thus Dupuytren affirms that an abscess is never a primary disease, but invariably the effect or termination of a more or less intense and extensive inflammation of the living tissues. "Wherever," says he, "suppuration is observed in any part of our organization, whatever may be the qualities of the matter, we may be sure that some kind of irritation, acute or chronic, apparent or concealed, must have existed or must yet exist, either in the situation occupied by the purulent collection, or in some remote part which communicates with this point, and is the source from which the matter is derived." Dupuytren maintains that this proposition is founded on the most accurate pathological investigations, and admits of no exception, whatever may have been asserted respecting collections of pus, supposed to be the result of substances absorbed and circulated for a time in the vascular system. Whether abscesses form slowly or quickly, whether they attain a considerable size or remain within narrow limits; and whether they contain pus of one quality or another, inflammation of more or less intensity, according to circumstances, seems to Dupuytren, and I may say, to the greatest number of modern pathologists, to be always being concerned in their production. To this subject, however, I shall return in considering particularly the process of suppuration, under which head the formation, symptoms, and treatment of abscesses generally will be detailed. (See also ANTHRA, ANTHRA, ERYSIPELA, HYDROCELE, LUMBAR ABSCESS, MAMMARY ABSCESS, PARASTERNAL SCARF, and WHITLOW.—C.)

[ABSORPTION. The source of the lymph is

less certain than that of the chyle; for, even at the present day, M. Magendie, influenced by the possibility of injecting the lymphatics from the arteries, and by the uniform nature of the lymph, and in analogy to the blood, professes a belief, which was common many years ago, that it is not formed by the decomposition of the old particles of the body, nor by fluids absorbed from various surfaces, but that it is composed of the thinner parts of the blood, which, instead of returning by the veins to the heart, pass into the lymphatics, and are conveyed to that organ through the thoracic duct. The lacteals certainly have little disposition to take up anything but chyle; but, as Dr. Beudant has explained, "the lymphatics are capable of dissolving a great variety of substances, differing from each other most widely as their nature, so that it would almost appear as if, by a certain mode of application, any substance might be forced into them. Nor (says Dr. Beudant) is this conclusion affected by the hypothesis of M. Magendie; for, although we might agree with him in supposing that, in the ordinary operations of the system, the veins are the principal, or even the sole instruments in restoring the materials of which the body is composed, yet we have unequivocal evidence that, when certain poisonous or medicinal agents are applied to their extremities, they may be received or forced into them, and conveyed into the circulation. The case of metallic or other medicinal substances—that are taken up by the lymphatics, may appear to be less difficult to explain, because the absorption is generally produced by friction, or some mechanical process, which may be supposed to force the substance into the mouths of the vessels, or to produce an erosion of the epidermis, which may enable the substance to come into more immediate contact with the mouths of the vessels. We may also imagine that, when the component parts of the body are brought into close approximation with their capillary extremities, they are then taken up in the same way that the chyle is absorbed from the intestines." (*Elem. Syst. of Physiol.*, vol. ii. p. 363.) Many physiologists have little difficulty in conceiving how fluids can be taken up by the lymphatics, but rather stagger at the notion of this being also the case with the hardest solids. Others, however, accommodate their creed to both hypotheses, reconciling themselves to them by the argument that, if the minute capillary arteries can receive the densest matter, the small lymphatics can remove it. Our example is not more difficult to comprehend than the other. Yet such reasoning throws little light on the question, how are the solids prepared for absorption, and in what manner are they taken up? There, in fact, remains completely unexplained.

"What (inquires a pious physiologist) are we to conceive of the intimate nature of this operation? Is solution of the substance necessary, we are at a loss to find a proper solvent; many of the substances are insoluble in water, or in the serum fluid which is found in the vessels; while, on the other hand, it is perhaps not easy to conceive how the substance can be absorbed without being previously dissolved, and still more so how the solids can have their texture broken down, and enter the vessels, particle by particle, as it were, and be suspended in the lymph in a state of extreme comminution? These difficulties some physiologists, including Boerhaave, endeavour to diminish by arguing that the lymphatics

must be supposed to act only upon the elements of every texture, and that, on this principle, the absorption of solids is an exactly intelligible as that of fluids, the same elements frequently contributing to the composition of both.

While parts retain the vital principle, they resist the action of the absorbents. Dead matter is more easily acted upon by the absorbents than living; and, in fact, "no part can be absorbed until its texture is destroyed, and, consequently, until it is deprived of life. No substance can possibly enter the absorbents while a system is aggregated, so that it necessarily follows that the preliminary step to the absorption of the body is its decomposition." (*Beudant, Elem. Syst. of Physiol.*, vol. ii. p. 363.) This *disphysiologie* afterwards explains, that by the death of a part, according to absorption, is lost spiritual unity; that it is no longer under the influence of vital action. It therefore "loses its power to supply of matter which is essential to the support of all living parts, and the process of decomposition necessarily commences." A better account of the subject appears to be that which, dissolving all metaphysical and theoretical notions upon the supposed death and decomposition of parts previously to their absorption, represents the absorbents as acting directly upon the individual atoms, particles, or elements of the various textures. We know nothing about the vitality of these atoms or elements in their separate capacity; supposing them to possess it, we know nothing of the manner in which they depart with a previously to their entrance into the absorbent system, just as we are completely ignorant both of the manner in which such elementary materials acquire the vital principle, and of the exact moment when they *become* this or that.

It appears also, from various observations and experiments, that substances may enter directly into the bloodvessels, and thus get at once into the circulation, or else be conveyed from the surface on which they are placed, through a web the contiguous tissues, into the blood, by what M. Magendie terms *imbibition*. In both these modes, it is inferred that absorption does not necessarily require any action or substance of the lymphatic vessels themselves, the commencement of which, upon every surface and in every texture, by innumerable orifices or mouths, is not regarded by some distinguished physiologists at the present day as a doctrine by any means well established. Of course, what fluids would explain on this principle, they would refer to imbibition, in which the absorbed matter passes through the textures of parts into the circulation, or else gets more directly into the bloodvessels.—C.]

ANAUROSIS. Here the endemic application of strychnia deserves to be mentioned.

In the comments *unofficially* formed by experiment on light or *lightness*, we may clear out the alimentary canal with an active dose of calomel and jalap. Patients may then be exposed above the eyebrows; and if these fail, strychnia, or the external use of strychnia, may be tried. (*See Middlemore on Use of the Eye*, vol. ii.) In such cases Magendie would probably run on strychnia and continue over the frontal nerve.

In *anaurosis*, given the gradual effect of any exposure of the eye to real light, or of hard study by light of lamps or candles, the foregoing treatment would, I think, be less likely to answer. Here a slow inflammation of the retina has probably

been going on, followed by structural changes, the only chance of recovering which must depend upon depletion, mercury, and perfect rest of the organ. (See *Middlemore on Dis. of the Eye*, p. 325.)

In periodical amaurosis, attended with serious impairment or loss of vision, returning daily, weekly, or monthly, or at irregular intervals, the eye being little or not at all affected in the intermediate periods, the best means of cure are bleeding, purgatives, and counter-irritation. This treatment is especially applicable to hystericalgia.

In amaurosis excited by disease, the globe may be divided, mild laxatives and small doses of calomel or purgative given, and the child put into a warm bath. If amaurosis depend upon the irritation of a carious tooth, this should be extracted.

For amaurosis from a partial wound or laceration of the optic-nerve, the best plan is to make a free division of it.

Of late, strychnia has been employed as a remedy for amaurosis. It seems to Mr. Middlemore that its use should be confined to cases in which the nerve is in a state of atony from some direct action directly upon its texture, or upon its texture through the medium of the general debility of the system. At all events, he is of opinion that it should not be resorted to when there is much vascular fulness either of the system or the retina, or a tendency to inflammation. Its effects are likewise to be most carefully watched. An atonic state of the retina, or of some part of the nervous apparatus of the eye, productive of amaurosis, when unconnected with a full plethoric habit of body, determination of blood to the head, or any tendency to apoplexy, or any structural change either in the retina or its immediate nervous relations, may be treated by means of strychnia, particularly if tonic and general stimulants have been already unsuccessfully tried. The bowels are to be first freely opened, and spurious medicine occasionally given during the use of strychnia. Mr. Middlemore puts a narrow blister above the eyebrow of the affected eye, or above each eyebrow, if both eyes are involved; and after the crusts and scabs have been removed, sprinkles a small quantity of strychnia upon the raw surface, connecting with the fourth of a grain upon each side. If vision be not improved, this quantity may be gradually increased to two grains; the part is also dressed with styptic ointment. The strychnia is applied only once at twenty-four hours, and the eyebrow is protected as the place for its action, on account of the probable special effect of the strychnia upon the supra-orbital nerve, in addition to its other more general influence. If strychnia excite great local inflammation, it may be blended with a little flour or powdered opium. Mr. Middlemore observes, that, if the patient should become sensible of occasional flashes of light before the eye soon after the commencement of this treatment, there would be great encouragement to persevere; but that, if vision should be not at all influenced or improved after the strychnia had been tried a fortnight in sufficiently powerful but not independent quantities, it ought to be discontinued. Strychnia appears to him to be well adapted to the case of infants, whose eyes are affected with incomplete amaurosis, and who have been accustomed to follow their employment by means of a very feeble light, and also to cases of impaired sensibility of the mind, occasioned by too great a delay in curing

congenital cataract. (See *Middlemore on Dis. of the Eye*, vol. ii., p. 222.)

Strychnia has also been prescribed as an internal remedy for amaurosis.

The division into gouty and rheumatic amaurosis is more than doubtful.

"We can admit," says Mr. Lawrence, "that the nervous structure of the eye may be affected in the rheumatic and gouty, as well as in other persons; but it will require clearer evidence than we possess at present to show that there are distinct gouty and rheumatic amauroses." (*Lectures on Opth.*, p. 331.)—C.]

[AMPUTATION. Modification of a limb, after operation for aneurism, is another exception to the general rule of not amputating till the cicatrization has stopped. Where also gangrene arises from the obstruction of the circulation by an aneurism bursting, and its blood passing copiously into the cellular tissue of the limb, amputation should be performed without delay, though the cicatrization may not have stopped. An example of the success of this practice I have laid before the profession. (See *Med. Chir. Trans.*, vol. xii.)

DISEASED JOINTS.

Excluding from present consideration the proposal to splintate the extension of some joints which are in particular states of injury or disease, I may observe that *osteology joints*; with diseased bones and distorted ligaments and cartilages, is another case in which amputation may become absolutely necessary. As Mr. Pott remarks, there is one circumstance attending this condition often rendering it particularly unpleasant, which is, that the subjects are most frequently young children, so as to be incapable of determining for themselves, which inflicts a distressing task on their nearest relatives. All the efforts of physic and surgery often prove absolutely ineffectual, not only to cure, but even to retard the disease in question. Notwithstanding many cases admit of cure, numerous others do not. The disease often begins in the very utmost recesses of the cellular texture of the heads of the bones, forming the large articulations, such as the hip, knee, ankle, and elbow; the bones become diseased in a manner which will be explained in the article *Joints*, sometimes with great pain and symptomatic fever; sometimes with little or none, at least in the beginning. The cartilages covering the ends of these bones, and designed for the mobility of these joints, are totally destroyed; the epiphyses in young subjects are either partially or totally separated from the solid bones; the ligaments of the joints are so thickened and spoiled by the dissemper as to lose all internal appearance, and become quite unfit for all the purposes for which they were intended: the parts appointed for the secretion of the synovia become diseased in like manner. All these together furnish a large quantity of stinking serous matter, which is discharged either through artificial openings made for the purpose, or through small ulcers that open. These openings constantly lead to bones which are diseased through their whole texture. When the disease has got into this state, the constant pain, irritation, and discharge being so heinous symptoms of the most destructive kind, such as total loss of appetite, rest, and strength, profuse night-sweats, and so profuse purgings, which tell all the effects of weakness.

and bring the patient to the brink of destruction. (See *Pain on Amputation*.)

In these cases amputation is attended with more success when performed late than when undertaken at an early period, before the disease has made great advances. This is fortunate, as it affords time for a fair trial of such remedies as are best calculated to check the progress of the disorder. (See *Joints*.)

Whenever the disease of a joint is likely to terminate in ankylosis, amputation should not be resorted to, as a cure will be effected without it. (See *Ankylosis*.) In deciding to amputate or not, a great deal will depend upon the state of the patient's health and his kind of constitution, as well as upon the condition of the joint itself. Thus Dupuytren relates the particulars of two cases of distended elbow, with elevation of the cartilage, abscesses, sinuses, &c. In one, where the constitution was decidedly syphilitic, the hectic disturbance severe, the emaciation great, and the strength rapidly declining, the patient, a child, could only be saved by amputation. In the other case, where the constitution was less deranged and the strength better maintained, Dupuytren brought the disease to a conclusion by ankylosis. (See *Dupuytren, Clin. Chir.*, t. iv., p. 250.)

Surgeons should generally refuse to amputate limbs merely affected with stiffness or deformity. Operations under such circumstances, termed by the French *opérations de complaisance*, are more frequently followed by fatal consequences than amputations in more urgent cases. (See *Dupuytren, Clin. Chir.*, t. iv., p. 271.)

The ease with which the flow of blood through the largest arteries is commanded by manual pressure, is a fact attested by Dupuytren, who only employed the instrument which he terms the compresser in a few special cases. (See *Lepois Order, &c.*, t. iv., p. 377; *Elements*, part iii., p. 361; and *Ed. Med. and Surg. Journ.*, vol. xx., p. 241.) The following passage explains Mr. Liston's views of this subject: "In all cases, and in all situations and circumstances, hæmorrhage can be restrained during the completion of the incision, and during the employment of means to close the cut ends of the vessels, by means of very slight but exact pressure on the trunk of the principal vessel. (See also *Dupuytren, Lepois Order de Chirurgie Chir.*, t. iv., p. 382.) The point at which this should be applied should be at as short a distance as possible above the site of the incision, and, at the same time, above the origin of any branches which must be cut. Not the slightest pressure should be made until the instant when the incisions are about to be completed, so that no venous congestion may take place in the limb. All the blood in the limb below the incision must necessarily be lost. The veins are once really congested, then the arteries, and pressure made a short time before the operation may arrest the return of blood, while it may not stop its reflux. Thus, engagement of the lower part of the limb is produced, and the quantity of blood that must be lost is increased. For a similar reason, pressure sufficiently firm to stop arterial hæmorrhage is to be continued till the principal branches are tied, and then entirely removed, for the continuance of even such pressure will increase the flow of blood from the surface of the stump—blood flowing in, and being arrested in its venous return, trickles out through the open ends of the vein. If a circular band be used for the compression, such as the

screw-tourniquet, it should be put on quickly, screwed tight once, and then the tourniquet should not be delivered one instant." The doctrine and practice of Baron Dupuytren I will notice in the article HÆMORRHAGE. Baron Dupuytren did not employ the common tourniquet, nor any kind of compress furnished with a handle (see *Lepois Order de Chirurgie Chir.*, t. iv., p. 285); he sometimes avoided himself of an instrument which he termed a *compresser*, and which makes pressure only on two opposite points of the limb. (See *Lepois Order, &c.*, t. iv., p. 346.)

VARIOUS BAD CONSEQUENCES MAY FOLLOW AM- PUTATION.

As, for instance, rupture of the stomach, hæmorrhage, severe inflammation of the crura, abscesses and extensive sinuses, inflammation of the medullary membrane, necrosis (see *B. Phil. Mag.*, in *Lond. Med. Gaz.*, for 1833, 34, p. 189; protrusion of the bone, phlebitis, and suppuration in internal organs and in various other parts of the body, hospital pyæmia, &c. Of these several complications, which may either interrupt organization, or subject the patient to great and protracted suffering, it even lead to a total termination, some are common to every operation, others restricted to that which is now under consideration; some arise from external causes, others from internal. (See *Dupuytren, Lepois Order, t. iv.*, p. 425.) It is only necessary to refer to a part of these topics in the present place, because the others more properly belong to the articles HÆMORRHAGE, GANGRENE, NECROSIS, PHLEBITIS, SUPPURA, PYÆMIA, and TETANUS.

OF NEUROMATA AFTER AMPUTATION.

Sometimes amputation has been found necessary a second time, in consequence of a morbid protuberance of the nerves of the stump—a change noticed by Molinæ, Morgagni, Lower, Anstomus, and Prochaska, and always attended with excruciating pain and great instability of the part, and sometimes with retraction of the skin and protrusion of the bone. According to Mr. Liston, neuromata are most frequent after amputation of the arm and forearm than after amputations. The disease seems to him, however, to be less common than formerly, which he ascribes partly to discompositions having been more extensively adopted, and partly to the method of tying arteries, so as to include nothing else in the ligation. In the forearm I have seen only a neuroma follow amputation, and not above all the operations were curable. Sir Astley Cooper, in his Lectures, relates one instance of such a thing high up the arm, where, upon amputation of the part near the girth, a tumour was felt, which, when touched, made the patient jump as if he had been electrified. In the case, as the bone protruded, superstition at the shoulder was performed. In another example, where a ligature was in a painful, irritable state from a similar cause, Sir Astley Cooper effectually relieved the patient by removing the diseased end of the posterior spinal nerve. This plan should always be preferred to amputation, when it presents any chance of being efficient. In a third instance, amputation was repeated at the patient's desire, and the nerves were found enlarged, forming a ganglion which partly rested upon the extremity of the bone. Still a degree of irritation had been produced by it, that no part of the stump could be touched without exciting a kind of dis-

trip shock. In a case that occurred in the Middlesex Hospital, amputation of the thigh was performed a second time, in consequence of the first stump being thus diseased. A complete plegia, or plexus of nerves, was found closely adhering to the removed portion of bone, having assumed the appearance of cartilage. The os femoris was of an unusually small size, but the linea aspera larger than natural. (See *Lancet*, vol. i, p. 115; vol. vi, p. 192.) In the same hospital, Mr. Mayo also amputated at the hip, on account of the extreme suffering caused by a diseased state of the nerves of a thigh stump. (See *News*.) For such observations on the changes which occur in stumps after amputation, see STUMPS.

ON THE OBLIQUE OR OVAL AMPUTATION OF THE LEG.

The method adopted by M. Sedillot consists in dividing the integuments on the outer side of the leg obliquely, from before backward, and from below upward. The aneurism then carried round the posterior part of the limb to its inner side from behind forward, and from above downward. The division of the integuments is next completed in front by a transverse incision, leaving an oval wound, with its anterior angle truncated.

The only difference in the process of M. Blandin from that of M. Sedillot consists in making the incision through the skin entirely oval, and leaving the knife directed about an inch lower down in front than behind.

"One reason," says M. Malgaigne, "not mentioned by my writer, makes me prefer the oval even to the circular method. In the latter, the principle is to leave the integuments sufficiently long on every side to cover one half of the stump. Now the posterior integuments, on the retraction of the muscles, reach the centre of the wound more readily than the integuments in front, which have to pass and bend over the end of the tibia. The object then can only be fulfilled by allowing a greater length to the skin in front."—(*Manuel de Méd. Opér.*, p. 293.)

Oval amputation of the leg seems to me the most tedious and painful of all the modes hitherto proposed of removing this part of the limb. Nor can it be necessary, if care be taken in the other methods to save a sufficiency of the integuments in front of the limb, as advised in the descriptions already given of those operations.

AMPUTATION AT THE ELBOW-JOINT.

Depuytren, convinced of the correctness of the principle that as much as possible of the upper extremity should always be saved, termed the practice of amputating at the elbow whenever the state of this part and of the soft parts admitted of such operation. The humerus being slightly bent, a double-edged knife is introduced transversely in front of the joint from one condyle to the other, and a flap made of the soft parts of the upper and anterior part of the forearm. The day is now selected, the axillary and lateral ligaments cut, and the operation finished by the surgeon making through the sheath from before backward. The brachial artery is not divided, cut the radial and ulnar. The bleeding vessels having been secured, the flap is brought over the end of the humerus, and secured in this position with long strips of adhesive plaster.

When there is not a sufficiency of soft parts left for an integument flap, Depuytren used to amputate at the elbow with the circular method, the first incision through the skin and fascia being

begin three finger-breadths below the condyles. The integuments and fascia were then drawn upward, the knife applied just below the edge, and the muscles divided down to the bone. By next carrying the knife a little upward, and separating the soft parts from the bone, the joint was reached, and opened by cutting the lateral ligaments and forepart of the capsule. The operation was completed by dividing the sheath with the saw. (See *Depuytren, Leçons Orales de Clinique Chir.*, t. iv, p. 308.) Amputation at the elbow was practised by Depuytren in ten or twelve examples with great success, and the method is highly recommended by Mr. Liston. (See *Elem. of Surgery*, part iii, p. 281.)

[Dr. John Kearney Rodgers, of New-York, has twice amputated at the elbow, once after the method of Depuytren, and once removing the sheath during the operation.—*Revue*.]

AMPUTATION AT THE WRIST, OR RADIO-CARPAL ARTICULATION.

The hand may be amputated at the joint of the wrist whenever the disease does not extend too high, and a flap can be made either from the integuments of the back of the hand or from those of the palm. Liston makes both an anterior and a posterior flap. The circumstances of the case should determine the choice. Here amputation may also be done by the circular incision. The scaphoid, sesamoid, and carpal bones form a convexity which is almost entirely received in the concavity of the radius, the ulna having no connection with this joint except through the intervention of the triangular ligament, and to the extent of about four lines. The styloid processes of the radius and ulna can be readily felt, and below them the articulation continues; but, as Malgaigne observes, the direction of the joint is less easily determined; and if, while the hand is extended, the wrist itself be alternately bent and extended, these motions will take place in the radio-carpal articulation, into which the surgeon might erroneously carry the knife. The following are the instructions given by M. Malgaigne for the avoidance of this mistake:

1. If the hand be extended very much backward, the spot of the angle formed with the forearm will denote the radio-carpal articulation.
2. The transverse projection of the radius forward may also be felt, the joint being one line below it, and about five lines above the continuous wrinkle between the palm and the forearm.
3. The situation of the ends of the styloid processes being determined, and a line drawn across from one to the other, the middle of the joint will be two lines and a half above such transverse lines.
4. If only the styloid process of the radius is perceptible, that of the ulna is known not to descend so far as a by two lines; and the middle of the joint is three or four lines higher.—(*J. P. Malgaigne, Manuel de Méd. Opér.*, p. 394.)

The projection of the radius and carpal bones beyond the level of the palmar surface of the radius and ulna must be remembered in the operation.

Amputation by the circular method is performed as follows: An assistant draws up the integuments, and the surgeon makes an incision through them all round the wrist, about an inch below the styloid processes. The skin may now be easily retracted nearly as high as the joint; a severe incision, made so as to leave the palm

and sometimes bones just beyond it, divides all the tendons on a level with the retracted skin. The joint is then to be cut into on one side or the other, under the guidance of the corresponding stylized process, and the knife directed through the articulation in a line answering to the posterior-superiority of the acromion, humeri, and coraciform bones. The radial and ulnar arteries are now to be tied, but the interosseous have seldom requires a ligation. The wound is to be closed with the line of it in the transverse direction, and the stump placed in a depending position, so that, if suppuration take place in the tendons or vessels or under the bone, the matter may not pass far up the limb.

In the double *hyperamputation*, as executed by Lisfranc, the hand and forearm are placed in the supine position, and supported by an assistant, who at the same time makes pressure on the radial and ulnar arteries. The surgeon, with a narrow knife, transfixes the soft parts on a level with the styloid processes, and from the radius towards the ulna, or from the ulna towards the radius, according as he is operating on the right or on the left limb. The knife is then carried along the anterior surface of the corpus, and its edge inclined forward so as to make a semicircular flap about two inches in length. This flap being held back, another very similar one is made on the back of the wrist; the extrinsic tendons are then to be cut through easily on a level with the articulation, the joint opened just below one of the styloid processes, and the disarticulation finished as in the circular method.

When the soft parts are so diseased that two flaps cannot be saved, the operation may be done with a single one, which should then be made somewhat longer.

In several cases of injury from the bruising of firearms, by reason of the laceration of interosseous on the palmar surface of the wrist, it has been found impracticable to have lost one flap, and that brought from the back of the wrist. In these cases of amputation at the joint, I have not met with any impediment in making a good stump. There can be little doubt that it is preferable in all cases to amputate at the wrist for injuries of the hand, instead of operating midway upon the forearm or above the wrist, as some surgeons have been in the habit of doing. Not only is there less trouble in healing the stump over the end of the radius than over the ends of two bones, but fewer ligatures are required, seldom more than two; and, what is still more important, the patient will find the stump more useful to him in after life.—*REMARK.*

AMPUTATION AT THE HUMERUS.

The propriety of the operation in *hyperamputation* is now perfectly established.

Thus, as M. Velpeau observes, a comminuted fracture, an *os-seo-carcinoma*, a *spina-ventosa*, any incurable disease of the bone extending above its shaft; gangrene; in short, any disease reaching to the vicinity of the hip, and so serious as to require the removal of the limb, are cases for amputation at this joint, provided the acetabulum and the bones of the pelvis be unaffected. It is indispensable for gunshot wounds of the upper third of the thigh, combined with fracture. (See *Nouv. Éléms. de Méd. Opér.*, t. i., p. 510.) It was performed by Mr. Mayo for a neurilic affection of a thigh stump.

AMPUTATION AT THE SHOULDER-JOINT.

The head of the humerus represents nearly

the half of a sphere, scarcely one third of which is recovered by the glenoid cavity of the scapula, the rest being contained in the extremely loose capsule of this articulation. The intrinsic muscles are held together principally by the *deltoidei*, *supra-spinatus* and *infra-spinatus*, *teres major*, and *sub-scapularis* muscles. The joint is also very much strengthened by the tendons of the long head of the biceps, and by the necessary ligament extending from the acromion to the upper part of the humerus. Above the articulation is a kind of osseous-fibrous cap, formed by the acromion, the coracoid process, and the ligament stretched between them. The arch projects more than an inch in front of the glenoid cavity, and descends farther in the direction backward than in that forward. (See *J. F. Malgaigne, Manuel de Méd. Opér.*, p. 328.) If we examine the anatomy of the shoulder from above downward, we first meet with the *deltoidei* muscle, covered by the *effluviament*, *over* three of the pterygia, and a very thin skin. Then we come to a loose cellular tissue, the tendon of the *supra-spinatus*, *infra-spinatus*, *sub-scapularis*, and *teres minor*, the necessary ligament and fibrous capsule, and the tendon of the long head of the biceps. Lower down we arrive at the scapular portion of the triceps, and then the fascial plexus of nerves, the arterial vessels; and, under the skin, the *pectoralis major*, the *lanceolatus dorsi*, and the *teres major*.

The apex of the acromion is very perceptible just above the cushion of the shoulder, as well as the coracoid process more towards the chest. Between these bony points is situated a triangular interval, useful to be recollected by the practical surgeon, bounded outward and downward by the head of the humerus; above by the *clavicula* and *acromion*, or, rather, by the *os-seo-epitrochiale* ligament; and inwardly by the *coracoid process* itself. This is the place where the joint may be at once cut into without any incision from the bones; and it is on the knowledge of this fact that Lisfranc proposed one of his methods of amputating at the shoulder. When the posterior border of the coracoid is reflected towards the scapula, as Velpeau observed, the knife may be made to pass below the acromion into the superior and external part of the joint. In some persons, the acromion is much more prominent than in others; and occasionally it is considerably depressed, so that its humeral aspect forms a deep concavity. In children it is cartilaginous; and Velpeau found it in two adult bodies separable by a very slight effort, as an epiphysis from the spine of the scapula. (Velpeau, *Nouv. Méth.*, t. i., p. 428.) The course of the circumflex arteries, that of the circumflex nerve; the situation of the necessary space extended from the acromion to the humerus; and, in particular, the origin and track of the tendon of the long head of the biceps, between the fibrous capsule and the synovial membrane into the humeral groove of the humerus; the insertion which the *myositis* is attached to the humerus just below its anatomical neck; the very specific form formed by the junction of the head with the shaft of the bone; and the circular shape of its head, requiring an incision of corresponding figure for the prompt division of the fibrous capsule, are all interesting points of surgical anatomy, without a due knowledge of which a surgeon cannot amputate at the shoulder with skill and judgment.

The principal methods of amputating at the

shoulder are comprised under four varieties: 1st, the operation with one flap; 2d, with two flaps; 3d, by the oval method (Scarsdale); 4th, by a circular incision (Alcock, Scarus, &c.). Here one fact needs particular attention, namely, that no mode of amputating at the shoulder can be exclusively justified in all the cases requiring the operation, because the soft parts around the joint are frequently destroyed, or very much injured in a greater or lesser extent, so that the surgeon is obliged to save skin and muscles whenever he can find them. On this point, Desautel fully agrees with the surgeons of the British army.

AMPUTATION OF THE FINGERS AND OTHER PARTS OF THE HAND.

Amputation of the fingers, or parts of them, is performed with one or with two flaps, with a circular or an oval incision, and frequently required, either primarily or secondarily, on account of various accidents and diseases, as comminuted fracture, dyschiria maligna, necrosis, &c. The best surgeons all agree with Mr. Searcy, that in general the operation is most conveniently performed in their articulations, though exceptions sometimes occur in which it may be done elsewhere, and the phalanx divided with the cutting-pliers. Thus it occasionally happens that either the distal or the middle phalanx is torn off, and the end of the proximate phalanx exposed; here, instead of removing the whole of the middle or of the proximate phalanx (as the case may be), it will often suffice to take away the diseased portion of it with the cutting-pliers, and save a proper flap for covering the end of the remaining part. As Mr. Liston has explained, it is sometimes desirable to save as much as possible of the proximal phalanx when amputation is rendered necessary by illness of the middle articulation, or of the distal extremity of the bone. In such cases two semicircular flaps are made by cutting from without, either on the lateral, or on the palmar and dorsal aspects, and the bone is divided either with a small saw or the cutting-pliers. (Elements, &c., part iii, p. 324.) When an injury just includes the joint and no more, Mr. Guthrie desires it better to saw through the bone than to operate at the next articulation! (On Gunshot Wounds, p. 384.)

AMPUTATION OF THE DISTAL AND MIDDLE PHALANXES.

The distal bones are but loosely supported by the anterior ligament, and behind by the extensor tendons: at the sides, however, they are much more closely held together by the lateral ligaments. Consequently, it is those which must be divided in order to lay open the joint freely. The line of the articular interval is nearly transverse. Between the distal and middle phalanx it is on a level with the palmar cutaneous furrow; but in the articulation of the middle with the proximate phalanx, it is a line and a half below the palmar furrow. (See J. B. Malgaigne, *Manuel*, &c., p. 205.) In either of these joints the operation is done in a very similar manner; either with a single flap, taken from the palmar surface of the finger, and long enough to cover the whole surface of the wound, or with two flaps, the longer one being turned on the palmar side, and the shorter one on the back of the finger. The surgeon, taking hold of the finger and placing it in the bent position, makes, with a narrow latissimus, an incision (I should say a semicircular one) across

the prominence of the articulation, or, as Malgaigne directs, half a line below it. Thus the skin is divided, and the posterior part of the capsule generally opened with the same stroke. If it be not, the surgeon, without stopping to effect this, may proceed to cut the lateral ligaments one after the other; and the two being next converged through the articulation, the operation is completed by the insertion of the palmar flap, which is to be the larger of the two, and long enough to cover the greater part of the wound. (See Desautel, *Leçons Orales de Chirurgie Clair.*, t. iv, p. 205; Malgaigne, *Manuel*, &c., p. 206.) When both phalanges are to be removed, the dorsal incision should end on each side precisely on a level with the terminations of the cutaneous palmar furrow.

Another method, ascribed to Lisfranc, consists in attacking the joint on its palmar side. All the fingers are bent except that which is about to be amputated. The point of a narrow straight bistoury, with the edge directed towards the extremity of the finger, is introduced half a line beyond the palmar cutaneous wrinkle if we are amputating the distal phalanx, and exactly at the base of this wrinkle if we are removing the middle phalanx. The knife is to pass through the finger from one side to the other, and close to the lateral and anterior surfaces of the bone, along which it should be carried to the extent of six lines, and then brought out so as to complete a semicircular flap. The knife is then carried again to the base of the flap, to divide the anterior ligament. In this operation the lateral ligaments scarcely require to be cut separately; for the same stroke of the knife by which the anterior ligament is cut, necessarily cuts them also, and makes room for the knife to be recovered through the articulation. Lastly, the tendons on the dorsal aspect are divided, without any posterior flap being made. By this method a more regular and better-nourished flap is produced, and the operation is more sure of being effected with precision; but the extensor tendon is apt to remain too long, in which event its projecting end should be cut off with scissors.

The circular method of amputating a finger is the oldest. The finger is put in the extended posture; a circular incision is made three or four lines beyond the articular interspace, the situation of which is denoted by the position of the palmar cutaneous furrow. The skin is dissected up as far as necessary, and the joint opened either in front or behind, as in the flap-operation already described. Or, if the disease or injury will admit of it, the integuments may be drawn up before the circular cut is made, and thus little or no dissection of them from the adjacent parts will be necessary. In general, after amputation of the distal and middle phalanges, the bleeding ceases as soon as the wound is brought together with adhesive plaster, and no ligature is required.

AMPUTATION AT THE METACARPAL-PHALANXIAN ARTICULATION.

Each of these joints is of the enarthrosis kind, and furnished only with loose ligaments. What is termed the knuckle, or the articular prominence, seen when the phalanx is bent, is formed by the head of the metacarpal bone. The joint is commonly about ten or twelve lines above the digital commissure.

1st Method.—The hand being placed in the pronated position, and the other fingers held apart

from the one about to be removed, the phalanx is to be bent, as Liston specifies, to an angle of 45°, and an incision begun over the head of the metacarpal bone, about three lines beyond the articulation, and extended obliquely down to the side of the finger, on a level with the distal epiphysis, care being taken to divide as completely as possible the extensor tendon. The incision is then carried to the palmar aspect of the joint, and the first flap completed, which is to be reflected. The knife is now pushed into the exposed side of the articulation, the ligament cut, and the operation finished by the formation of the opposite flap, which ends, like the first, at the distal condyloid.

The following is Mr. Liston's description of this method: The operator seats himself before the patient, grasps the finger so as to manage its movements with the left hand, and, holding the knife perpendicularly, with its point upward, lays it over the knuckle, and carries it obliquely upward, so as to open that side of the amputation. He then pushes the finger towards the opposite side, and with the point of the knife completes the loosening of the articulation, which should never be done with the blade, as it would cross-cut and mangle the skin. After the separation of the base of the phalanx with the point, the blade is passed behind; and, being carried downward and outward, it forms a flap similar to the first. They are retained in contact by bringing the neighbouring fingers towards one another. In general, this will also stop the bleeding, but sometimes one or both digital arteries will require ligature. (See *Liston's Elements*, part III, p. 373.)

When this operation is done on the index finger, the outer flap should be the larger; when on the little finger, the inner flap should have the greater size. (See *J. F. Malpouge, Manuel*, &c., p. 310.) Depuytren, instead of cutting the integuments obliquely, preferred dividing them perpendicularly, and making a semicircular incision, directed from the dorsal towards the palmar aspect of the finger. Another semicircular flap was next formed on the opposite side. As Depuytren found that, when the ring or middle finger had been removed, without taking away the head of the corresponding metacarpal bone, the adjoining fingers remained widely separated at their base, but obliquely approximated to one another at their extremities, so as to produce a considerable deformity, and an impeded action in their function, he used not to be content with amputating the phalanx, but made it a rule to apply a retractor, and saw off the head of the metacarpal bone. (See *Liston's Elements*, &c., t. IV., p. 369.) I know that Sir Astley Cooper has long advocated the same practice, which is most readily accomplished with a pair of strong cutting-pliers. The extension of this to one of the metacarpophalangeal articulations may also be another reason for taking away more or less of the metacarpal bone along with the finger. If merely the distal end of the bone is affected, the following plan of operation will suffice; but, as is remarked by Mr. Liston, if a considerable portion of the metacarpal bone is to be taken away, the palm should be left unimpaired. "With this view, the knife is extended over the dorsal centre of the bone, above the diseased part, and carried straight downwards till near the articulation, when it is made to diverge for the formation of lateral flaps. The incisions in the track of the wound are then directed backward, so as to expose the

bone completely, and the history is passed round it throughout its whole extent, the edge being kept close to it. Then the bone is clipped at the proper joint by the cutting-pliers; or the section of the bone may be performed before the separation of the soft parts from its outer surface, as by raising the cut end this part of the operation may be facilitated." (See *Liston's Elements*, part III., p. 377.)

AMPUTATION OF THE THUMB.

If merely the anterior extremity of the metacarpal bone were diseased, the bone might be divided with the cutting pliers, as is to remove the part affected, amputation being done either with the circular incision or a flap. (See *Vulpes, Nouv. Éléms. de Médec. Opér.*, t. I., p. 389.) An operation more frequently practised, however, is disarticulation at the joint, between the metacarpal bone of the thumb and the trapezium. The metacarpal bone is almost subcutaneous at its posterior and external aspect, but covered by a thick mass of muscle on the side towards the palm. The direction of the articulation is oblique, corresponding to a line, which, if carried far enough, would cross the root of the little finger. It has a loose capsule, and may be opened with the greatest facility at its two posterior thirds. The tendons of the long abductor and short extensor lie over the superficial side of it. The radial artery runs over its ulnar side in its way to the palm, to form the deep palmar arch. The tendon of the long extensor lies behind, and that of the long flexor in front of it. The plane of the joint is readily determined by passing the forefinger over the dorsal aspect, or the side of it, from before backward, for it is situated immediately behind the first bony tubercle. (See *Vulpes, Op. cit.*, p. 390.)

Let Method.—While the thumb is still in the position of abduction, the knife is applied to the middle of the commissure; an incision is made at once down to the carpus, the edge being carried close to the ulnar side of the metacarpal bone, which is about to be taken away; the joint is then opened by cutting outward, the flexor tendons divided rather with the point than the blade, so as not to grope out the skin; the thumb abducted and dislocated, and a flap formed from behind forward, by carrying the knife close to the outer side of the bone, and a few lines beyond the metacarpophalangeal joint. If the radial artery itself has been wounded, it must have a ligature; but, in other cases, turning the flap accurately over the wound will stop the bleeding. Besides splitting adhesive planes, the flexor, and especially its base, should be exposed with a compress and bandage.

2d Method.—An assistant takes hold of the thumb, while the surgeon takes as much of the soft parts as possible with the fingers of his left hand, and draws them outward. The latter then transfixes them with a straight narrow knife from behind forward or towards the palm, drawing the blade close to the radial side of the articulation. A flap is then formed; and, while this is held up by the assistant, the surgeon takes hold of the thumb, cuts through the joint from without inward, laxates the bone, and with the knife cuts through the middle of the commissure. This method leads to the same result as the former, but, being more difficult, would not be preferred.

3d Method.—Vulpes has frequently amputated the thumb in the following manner: An incision

is made along the back of the thumb from the styloid process of the radius to the commissure of the thumb and forefinger. This divides the integuments, the tendon of the long extensor, and a portion of the first interosseous muscle, so as to expose the joint. While an assistant holds gently the edges of the wound, the surgeon opens the capsule and dislocates the bone, which is then removed, care being taken to preserve as much of the flesh on the palmar side as will be required to close the wound immediately. Thus the palm of the hand is not at all wounded.

40, or *Distal Method*.—The operation is begun as in the foregoing plan. The knife is carried round the anterior aspect of the root of the thumb, and then over the dorsal one, thus severing all joining the extremity of the first. The point of the knife is next introduced into the articulation, which is cut through from its distal towards its palmar boundary. All that now remains to be done is to detach the bone from any fibres which may yet adhere to it, by carrying the knife in front of it from behind forward. The wound, when brought together, represents a straight line. (See *Figures*, *Pl. xiv.*, p. 392.) This method was described by Lisgar, Beckard, &c.

In hip-amputations of the leg, if appears to me that the anterior flap of integuments should be made longer, and the posterior flap of the integuments and muscles of the calf about one third shorter than is generally done. By this means the front of the legs will be better covered, and the frequency of excoriation diminished, while there will also be the advantage of the surface of the wound being considerably lowered below, where matter is disposed to form and lodge.

In the United States, amputation or excision of the clavicle was performed for the first time by Dr. Mott in 1828. In the twenty-first volume of the *Med. Chir. Trans.* are the particulars of a similar operation executed by Mr. Travers. Other cases I have noticed in the article *Bones, excision of*. In Mr. Travers's case, the operation was performed on account of a tumour of the clavicle. "A crucial incision was made through the integument and platysma myoides, one limb of which was nearly in the line of the clavicle, and the other at right angles, and the flaps and fascial coverings successively dissected down to the external base of the tumour. The pectoralis and deltoid muscles were then carefully detached from their clavicular origin, avoiding the costal nerve, and the fibres of the trapezius and cleido-mastoid muscles displaced on a director. One considerable vessel, in the situation of the transversalis humor, required a secure ligature. The circumference of the tumour was now well defined, though it as broad to be firmly imbedded, and sufficient its posterior aspect. Disarticulation of the apical extremity of the bone was next effected about difficultly, and the mobility thus communicated to the mass facilitated the completion of the operation. A director was now worked beneath the bone, as near to the sternal articulation as was practicable, and with a pair of strong bone nippers thus introduced, it was completely and cleanly divided. The subclavian muscle and a part of the rhomboid ligament were now detached from the tumour, and the mass being well raised by an assistant, while the edges of the wound were kept wide apart, by metallic retractors, the cervical psoealgia

of the tumour were separated from their remaining connections by a few touches of the scalpel, without injury to the subclavian vessels." The loss of blood did not exceed twelve ounces. The case terminated so favorably that there was scarcely any falling forward of the shoulder, nor any restriction of the motions of the arm. The young gentleman elevates it perpendicularly over his head, extends it horizontally, dines and sits at it behind the trunk, and performs the same extent and variety of circumference, and with equal promptitude and power, as the parallel movements of the opposite arm. The production of bone from the truncated sternal extremity of the clavicle extends at least two inches, and terminates beneath the centre of the cicatrix in a firm ligamentous band, adherent to the skin. (See *Med. Chir. Trans.*, vol. xxi., p. 138, &c. p. C.)

(In the *Amer. Jour. of the Med. Sciences*, vol. xxi. and xxiv., Nos. 44 and 51, p. 336 and 135, Dr. Geo. W. Norris, of Philadelphia, has published two papers, entitled "Statistics of Amputation," drawn from the records of the Pennsylvania Hospital. They have been prepared with great discrimination and skill, and in point of practical importance possess great merit, as exhibiting the results of this operation in the greatest variety of cases. They are highly creditable to their author for their originality, this being the first report of the kind ever published. Thus they are appreciated by the profession at home and abroad; shown in the fact that, since their publication, similar reports have been published by the Massachusetts, Liverpool, and University College Hospitals, and also by the Edinburgh Infirmary. The greatest benefits must result from these statistical publications in this and other departments of the profession, furnishing as they do the precise kind of information surgeons know how to estimate. The advantages of the numerical method in the collation of medical facts are becoming more and more obvious in every department.

That about one fourth of the patients subjected to amputation fail to recover, is the point which the statistical tables both of Dr. Norris, and Dr. Hayward of Boston, seem to establish; and hence our success in amputation would seem to better than that of European surgeons. That this may be true of hospital practice is possibly the fact; but to affirm that a similar proportion of fatal cases occur after this operation in private practice, is to do justice neither to American surgery. Professor Paul F. Eys, of Georgia, has denied the correctness of the inference sought from the foregoing statistics, and has published an article on the subject in the *Southern Medical and Surgical Journal*, and another in the *Philadelphia Medical Examiner*; and he appeals to the experience of Professor Mott and Professor Gibson in proof that deaths after amputation in private practice are very rare. Dr. Eys has himself amputated thirty-four times without losing a single case, and hence it was natural for him to reiterate against the representation that one fourth of the patients die after amputation.

The venerable Dr. John C. Warren, of Boston, informs me that he has performed eighteen amputations of limbs in private practice, of which seventeen were successful. But the same operation in hospital practice has been much less prosperous in his hands, for out of forty cases, ten died after amputation. I have no particulars

in relation to the nature of the sepsis which were fatal, although there are reasons which render any original operation in hospitals less successful than in private practice. The depressed constitution and intemperate habits of the great majority of hospital patients are, perhaps, among the most frequent causes of unfavorable results, as well as the late period of the diseases or injuries requiring amputation at which even such patients will consent to go to the hospital or submit to the knife.

In the late number of the *Boston Medical and Surgical Journal*, April 16th, 1861, an interesting case is reported, in which amputation was performed for a tubercular disease of the elbow-joint, which had resisted Lugol's iodine, iodoform and all other medications, in the Massachusetts General Hospital. The operation was performed by the elder Dr. Warren.

Dr. Allen Goldsmith has had extensive experience in amputation, and has never lost a patient when the operation has been performed for disease. Amputation after accidents, injuries, fractures, burns, and the like, have been in his hands most generally fatal, which he ascribes to the shock the system has suffered in such cases. He thinks his uniform success in amputating for the removal of disease is owing to his diligence in supporting the system by quinine, wine, sea-bathing, and other cordials, instead of depleting and reducing the patient, as is often done.

Dr. Moit, of New-York, has amputated at the hip-joint and shoulder-joint successfully. In amputations of the thigh, he prefers, after much experience, to transect the limb, and make the double flap above and below. He has found primary amputations decidedly less successful than secondary, and, with a view to the result, always prefers the latter. In the occurrence of traumatic mortification, he amputates before this process is stopped, if the state of the general system will at all admit of it. So, also, in the mortification consequent upon tying a large artery for aneurism in the extremities, he advises a similar course.

In spontaneous mortification, or gangrene, arthritis, Dr. Moit has amputated four times when the mortification was spreading, the earlier period having been lost; once on the thigh, and three times on the leg. Two thigh cases and one of the leg recovered.

Secondary hemorrhage after amputation has been generally arrested by list and pressure, with list upon the stump. In one case he found it necessary to tie the femoral artery in the middle of the stump, which arrested the hemorrhage, but it soon returned. He then tied the femoral just at the osseous neck, above the profunda, which was successful, and the patient recovered.

In dressing a stump, Dr. Moit has tried the plan of three or four stitches, and the application of cloths with cold water for the first day or two; but he greatly prefers to wait half an hour after all the vessels seem to be secured, for the occurrence of reaction, and, if there then be no hemorrhage, he adopts the old plan by antiseptic, adhesive straps, list, compresses, and roller.

Professor N. R. Smith, of Baltimore, reports in the *American Journal* of 1839 a case of peculiar interest, in which amputation of the thigh was successfully performed during progressive gangrene, resulting from a fracture of the thigh, in which the displaced fragment of the femur made pressure on the great artery and vein.

Dr. Nathan Smith, of New-Haven, performed

amputation at the knee-joint for the first time in America in 1824, and with complete success.

Dr. Parson, of Philadelphia, has recently amputated at the knee-joint for necrosis involving the head of the tibia; the integument of the leg, when so diseased as to leave no alternative but to remove the limb at the knee-joint, is amputate the thigh. He chose the former, and performed the operation for the third time in the country. The result has been most satisfactory. The patient bears her whole weight upon the condyles, a wire pad stuffed with hair covering her wooden leg, and the woman does the whole work of a maid-servant in a large boarding-house.

In amputations of the leg, Dr. Parson slopes the incision backward towards the posterior margin, about an inch higher than the median in the thigh. He has less fleshy skin, a better junction, less suppuration, and makes a better stump.

In amputating a leg far dry progress of the foot extending above the ankle, he found no necessity for a single ligature, the arterial trunks being closed with coagula and ligatures. The stump healed kindly, and the patient is well.

Dr. J. C. Cheseman, of New-York, has recently amputated twice at the shoulder-joint with success. This surgeon has also tied the external iliac artery for aneurism; twice removed the tibia for necrosis, and during the last two years has operated four times for strabismic laceria, performed twelve amputations of the thigh, eight of the leg, and three of the arm, in the New-York Hospital. The proportion of deaths after amputations have been, as at most of the other hospitals, about one fourth of the whole number. He has cured treated fractures of the thigh of long standing by extension at the ends of the bones.

Dr. Hæmer, of Philadelphia, has published an interesting paper on the subject of amputation at the shoulder-joint, with a description of new instrument for securing deeply-seated arteries. I regret that I can only make reference to the *Amer. Jour.* for 1861 for the important practical matter it contains.

Dr. J. Keamey Rodgers, of New-York, amputated at the elbow-joint with complete success in 1835, and Dr. Wagner, of Charleston, S. C., amputated successfully at the hip-joint a few years since. Dr. Murray, of Cincinnati, has been successfully amputated at the shoulder-joint.

Dr. Amos Prowbridge, professor in Wilkesby University of Lake Erie, has three times successfully performed amputation at the shoulder-joint. He claims to have been the first surgeon in the State of New-York who performed the operation. In this, however, he is mistaken, for his earliest date is 1850, while Dr. Rayle, of New-York, amputated at the shoulder-joint with success in 1792, and to him belongs the honor of being the first surgeon in America who attempted it. Professor Davidge, of Baltimore, repeated it soon after with similar success. Dr. Gibson has also performed this operation, and Dr. McClellan has repeated it six times with success. The latter surgeon has performed amputation at the neck of the thigh bone with success. Dr. J. Rhin Barton, of Philadelphia, has amputated at the shoulder-joint with success at least Dr. Gibbon, the latter as early as 1851.

Dr. N. R. Smith has performed amputation of the lower limbs more than fifty times, and has only lost five patients. Similar success has attended this operation in the hands of Drs. Moit,

Stevens, Barton, Gibson, Warren, and, indeed, all the leading surgeons of this country, many of them an extensive practice never having lost a single patient after amputation. If dismemberments have been witnessed in hospitals, according to Dr. Norris and Dr. Hayward, may it not in part be ascribed to the last haste in which amputations of limbs are too often performed in public practice, and often upon patients whose members would be preserved, or, at least, the attempt made to preserve them, if the cases occurred in private practice? That unnecessary amputations, or those of even doubtful expediency, are more likely to prove fatal than those which are imperatively demanded, does not admit of a doubt among practical men.—Raines.]

[ANAPLASTIC OPERATIONS. Anaplastin or autoplastin operation is the generic name which has been given to the restoration of lost parts, by the transplantation of cutaneous or subcutaneous flaps from adjacent sound parts, and relying upon the adhesive inflammation for effecting union, a portion of the transplanted integument being allowed to remain, by which the circulation may be carried on.

Of these operations several varieties have been reported to me by American surgeons, and I have in several instances witnessed their success. Dr. John Mason Warren, of Boston, has distinguished himself in this department by the number and by the success of his cases, some of which are reported at length in various periodicals.

Under the head of Rhinoplastic, it will be seen that Dr. J. M. Warren has employed dissection in the case, or, one time adopting the Indian method, by borrowing the flap from the forehead, and at another a modification of the Italian operation of *Telaezoni*, in which the skin is taken from the arm. His modification consisted in dissecting the flap from the forehead instead of taking it from near the insertion of the depressed muscle; a course which has many advantages when the flap desired is not larger than can readily be obtained from this locality.

Dieffenbach, of Germany, has perhaps done more than any other operator to revive anaplastic surgery, not only in his own country, but in France; for, on a late visit to that country, five weeks to the hospitals of Paris was afforded him, for practising the different species of operations for the restoration of lost parts. The brilliant success of Dieffenbach, Gaffie, and Lant on the Continent, of Linton in Great Britain, and Warren in the United States, has astonished the surgical world by the extent to which the different modifications of autoplastin operations are adopted.

Among the most important of these may be named the restoration of the lower lip and eyelid, after the excision of cancerous tumors, frequently practised by Dieffenbach; the closure of fistulous openings of the larynx and trachea, the vagina and urethra, &c., &c. The autoplastin method most generally adopted as applicable to these cases is that in which the flap required is taken in the immediate neighborhood of the part destroyed, then slid along, and confined in the desired situation by the twisted suture. This is what the French writers call "*autoplastin par glissement de lambeau*." Dr. Warren has repeatedly succeeded in this operation, for the removal of frightful deformities, and for supplying lost parts.

Dr. Mott, of New-York, has performed suc-

cessfully the rhinoplastic, geniofacial, lipoplastic, and urethroplastic varieties, for supplying a loss of substance by the transplantation and adhesion of sound integument upon the nose, cheek, eyelid, and urethra, as the names given to the several operations will indicate.

Dr. March, of Albany, has had complete success by the Indian method in two cases of rhinoplastic, and several other American surgeons have claims in this department, particularly Dr. George McClellan and Dr. T. D. Mutter, of Philadelphia, the latter of whom has had extensive opportunities in autoplastin surgery.

Under the article Staphylomyia, it will be seen that Dr. J. M. Warren has had extraordinary success by adapting this autoplastin method to the cure of congenital fissures of both the hard and soft palate. The soft palate having been prepared for simply largely by the usual ablation of its edges and the introduction of the necessary points of suture, the mucous membrane covering the roof of the mouth was carefully raised on each side of the fissure in the hard palate, and when thus detached, they were brought across the fissure and united like the soft palate by the interrupted suture, the flaps formed by the mucous membrane of the mouth being continuous with the detached edges of the soft palate. Thus, by a judicious union of staphylomyia and the staphyloplastic method, these shocking deformities are brought within the reach of surgery, even when there is extensive separation of the bones. In this operation Dr. Warren has done honor to himself, and earned this laurel for American surgery.

For the successful application of this operation to the lower eyelid by Dr. Warren, of Boston, Dr. McClellan, of Philadelphia, and Dr. Post, of New-York, see article *Rhinoplastic*. Dr. McClellan has also performed urethroplasty, geniofacial, and otoplasty. In the latter case the external ear was turned in the adhesions of the cicatrix following a wound of the head, and the deformity was amended by dissecting out the outflange, and elevating it to its normal position by flaps taken from the adjacent integument.

Dr. Frazer has thrice succeeded with rhinoplastic, and has applied the autoplastin method for restoring the upper and lower lip, and for contractions of the mouth, and has repeated lipoplastic, urethroplasty, and cheloplasty several times with success.—Raines.]

[ANCHYLOSIS.—The following article having been re-written by Mr. Cooper, is deemed worthy of quotation entire.

ANCHYLOSIS (from *ancklos*, crooked). True or complete anchylosis signifies the fixed and immovable state of a joint, resulting from the articular surfaces being consolidated together by osseous matter. False or incomplete anchylosis denotes the loss of motion, or very considerable rigidity in an articular or gimbal joint, occasioned by adhesions of one synovial surface to the other, or by a thickening of the soft parts on the outside of the joint. By Mr. Mayo, anchylosis is divided into osseous, cartilaginous, and serous, according as the articular surfaces happen to be united through the medium of bone, of cartilage, or of both these substances together. (See *Outline of Human Pathology*, p. 72.) Of course, this last classification is not intended to comprise some of the varieties of false anchylosis. True anchylosis, then, may be said to denote an intimate osseous consolidation, either of the kind of joint termed diarthrosis, where the

ends of the bones are tipped with cartilage, and furnished with a capsular ligament, or, at the other less movable sort of joint, termed symphysis, where the bones are united by an intervening layer of fibro-cartilage, and the articulation is strengthened externally by ligamentous bands. The latter kind of joint can hardly be said to be susceptible of true ankylosis, for it naturally has only a very slight degree of motion, which requires a true ankylosis for its termination.

Ankylosis is more common in the zinguloid articulations than others, though sometimes met with in every description of joint. In general, only one joint is ankylosed in the same individual; but sometimes several articulations are the seat of ankylosis, and rare instances are recorded in which every joint in the body was in this state. Thus, Bernard Connor describes an example of a general ankylosis of all the bones of the human body (*De stupido Ossium Coactu*). The particulars of a child, twenty-three months old, afflicted with universal ankylosis, are given in *L'Hist. de l'Art. des Sciences*, &c. 1718. In old age, ankylosis in certain parts of the skeleton is a natural elongation; and at this period of life it is common to find the heads of the ribs ankylosed to the bodies of the vertebrae, or the tubercles to the transverse processes, the vertebrae to one another, the epichondri cartilage to the scapula, &c.

Ankylosis, strictly speaking, is not a disease itself, but only an effect or consequence of other affections, and it may follow all those which destroy any one of the conditions, without which the motion of a joint is necessarily interrupted, either permanently or for a very considerable time. The author of the article *Ankylosis*, in the *Encyclopædie Méthodique*, refers to a preparation, in which the humerus is so ankylosed with the scapula and clavicle, that both the compact and spongy substances of these bones appear to be common to all of them, without any line of separation being discernible between them. Eustachius, Columbus, and Cruveilhier, have each seen an ankylosis of the lower jaw. In the Museum of the London University is a specimen of ankylosis extending to eleven vertebrae. In the same collection are examples of ankylosis between the occipital bone and the atlas, between the atlas and the dens, and between the three upper cervical vertebrae. There may also be seen perfect ankylosis of the three bones of the knee, those of the elbow and hip, of the metacarpal bones to one another, and of the scapula to the os humeri. Cruveilhier has given the particulars of an ankylosis of one of the articulations of the lower jaw in a very old woman. It commenced in her childhood, from a blow on the side of the face. From the ankyrosis of the parts, it appears that the condyle and glenoid cavity were completely consolidated and filled by osseous matter.

Referring to ankylosis in general, we may observe with M. Sanson, that its causes are numerous, inasmuch as every circumstance capable of impairing the articular surfaces, stopping the synovial secretion, lessening the suppleness of the ligaments, or of the soft parts around the joint, and interfering with the action of the muscles or the play of the tendons, may hinder the articular surfaces, more or less, from moving upon one another. One thing, almost essential to the production of ankylosis, is the part being kept motionless; and, as M. Sanson well ob-

serves, this condition has such influence, that it will of itself bring on the changes which terminate in a joint becoming incapable of resuming its function in consequence of true or false ankylosis. An illustration of this fact is afforded by what happens to the Indian fakirs, who, by way of religious penitence, sometimes condemn themselves to continue motionless in certain attitudes for several years, and whose limbs at the expiration of the term are ankylosed in the posture in which they happen to have been as long maintained. The same fact is exemplified in persons who have met with fractures of their limbs, &c. in consequence of the motionless state in which the part is kept to promote union of its broken bones, the synovial secretion is diminished, and the fibrous connective and ligaments of the joint all acquire a rigidity in which the surrounding cellular tissue participates. The elasticity of the tendons are also no longer any advantage. All these circumstances make opposition to the free action of the muscles, which, being thus deprived of their natural elasticity, are incapable of overcoming the resistance to the motion of the joint. On the same principle, a long continued motionless state of an articulation, ankylosis may be induced as a consequence, and sequel of the contracted state of some muscular vessels, or of the growth of various tumours near the joint. The contraction of tendons also takes, or after a destruction of the soft parts by gangrene or ulceration; and in impeding exit of the cellular tissue, the effect of extension and moderate abrasion in it; certain tumours, and especially inflammation of the synovial membrane, whether acute or chronic, idiopathic, ankylosis, or rheumatic, &c., or accidentally excited by mechanical injury of the joint, are all so many circumstances capable of leading to ankylosis. Particular fractures of the joints, or such as are situated near them, if not skilfully treated, are apt to be followed by inflammation of the synovial membrane, absorption of the cartilages, and complete ankylosis. No doubt, in some of these instances, the connective ankylosis at first only to what authors understand by false ankylosis; but, in the course of time, this becomes converted into complete or true ankylosis, terminated by osseous consolidation. On the whole, however, as M. Sanson has remarked, false ankylosis is far more common than the true form of it.

When a bone is fractured near a joint, and this is kept too long motionless, ankylosis is apt to follow. Here the risk is increased by the synovial membrane being freely inflamed; and, indeed, sometimes the accident brings on ulceration of the cartilages. In the North London Hospital, I lately saw a case where the ulceration had been broken across its base, and the detached pieces had become completely consolidated in the bursæ; yet the patient had great exertion power of extending the forearm, motionless through the medium of the long supinator and other muscles arising from the outer condyle. It is partly in consequence of the risk of inflammation of the synovial membrane and of ankylosis that fractures of os very near joints are now seldom treated other differently placed. Wounds and contusions of joints may bring on such changes as terminate in ankylosis. I have already mentioned that Cruveilhier has seen an instance of ankylosis of the right articulation of the lower jaw. This was brought on by a blow received on the part when the patient (a female)

was a child. She lived to a very advanced age, and, notwithstanding the ankylosis, was able to speak very well, and to maintain by passing the food with her tongue, during the hard substance covering the alveolar process, where the teeth were deficient." (*See Greenough, Anat. Pathologica, lxxix. pl. Symp. 3 and 2.*)

With regard both to true and false ankylosis, the surgeon may generally render good efficient service in preventing, that in consequence to cure them. In wounds, contusions, and lacerations of new joints, the best means of prevention consist in the previous addition of the hyaline treatment at first, and of a later stage in having closely pressure to pressure margin of the joint, and then to substitute with this plan fixation with unabsorbent and other liniments, in order to promote the formation of the synovial. When the bones are exposed, as in syphilitic disease of the vertebrae, and in advanced stages of ulceration of the parotids of the knee, elbow, wrist, &c., the hyaline method of excision, to prevent ankylosis, should possess its secondary, as the most favourable result, which the case requires. In fact, the excision of ankylosis, well-timed, the indication of the disease, the important position, however, under high circumstances, to let the limb be ankylosed in the position where will allow it to be of the greatest possible use. Thus, when the elbow is likely to be the seat of ankylosis, the hyaline should be kept less than when the knee is concerned, the use should be kept extended, and when the hip, the thigh should be maintained in a similar position. If ankylosis should have taken place to a certain extent, with the limb in a disadvantageous position, this may often be still very much improved by the application of splints, and other mechanical appliances. The action of any mechanical appliances, however, must be applied moderately, through stimulating. Perseverance will here succeed when violence would fail by bringing an already painful a disorganized degree of inflammation. Indeed, when the attempt to remove a false ankylosis by gentle passive motion, enemas, and the cautious use of mechanical means, fail, it is better not to employ violence, because such an ankylosis is preferable to inflammation, abscess, and ulceration of the joint.

As for true ankylosis, where a complete osseous consolidation has taken place, it may be set down, not only as incurable, but as obligating of no improvement or absorption in the position of the limb, and, whatever that may be, the patient must be content with it. Hence, where there is risk of ankylosis, the great importance of placing the limb in position is the position which will be of the greatest service to the patient.

Mr. Barton, one of the surgeons of the Epsom Hospital at Philadelphia, made, a few years ago, the bold attempt to cure an ankylosis of the hip-joint by a surgical operation. (*See North American Medical and Surg. Journ. for April, 1827.*) The patient was a young soldier, who had fallen into the hands of a shipwrecked man, and remained seven days without surgical assistance. He was now admitted into the above hospital, under Mr. Barton. The injured thigh, which was the right one, was in the best position, with the knee drawn across the lower part of the left femur. The inside edge of the foot was placed forward, and the sole turned outward. A suspicion of dislocation was im-

mediately entertained; but, so great was the swelling, and so acute the pain in the hip, that Mr. Barton was deterred from making a digital examination to ascertain the fact. As soon as these symptoms had subsided, the limb was kept for several weeks extended in an apparatus, but without producing any absorption, or change in its position. Indeed, a complete ankylosis between the femur and os ilium had taken place. After a year's consideration, Mr. Barton, seeing that the case was beyond all common means of relief, determined to attempt to make an artificial joint. For this purpose, he made in the upper part of the thigh an incision six or seven inches long, the middle part of which corresponded to the great trochanter. The centre of this last cut was crossed by another four or five inches in length, at a right angle. These incisions divided, at intervals, the skin, the fascia, and muscles, so as to expose the articular and posterior part of the femur, between the great and little trochanters. The femur was then sawn through, between the great trochanter and the neck of the bone. The operation was completed in seven minutes; and, at once as it had been done, the limb was easily brought into its proper position, and, and could not to be more than about half as much shorter than the other. The wound, which had by itself, was now closed, and the limb put up in a suitable apparatus, with one of Boggan's screws. At first the inflammation, swelling, and inflammatory fever were so severe, but in ten days these symptoms abated, and the wound suppurated favorably. Suffice it to add, that the patient could move his thigh in all directions, and was able to get up; and in four months he was able to walk a considerable distance. He could, by this time, move the foot twenty-four inches forward, twenty-six backward, and twenty laterally, and flex it six inches inward or outward. The limb was strong, had so much shorter, that the patient walked very perfectly. Before the new joint was a deposit of bone, securing the femur in this position, and preventing its dislocation. Although the successful result of Mr. Barton's operation is what his colleagues fully deserved, I agree with Mr. Simon in thinking that doubts will be entertained by many judicious surgeons whether the proceeding, which actually put the patient's life in jeopardy, was really indicated.—O.

(Notwithstanding the opinion expressed by Mr. Cooper and Mr. Simon, adverse to the surgical competency of Dr. Barton's successful operation, while they commended its ingenuity, boldness, and success, this same gentleman has raised for himself and the profession new laurels by another and original operation for the removal of a shocking deformity of the knee-joint by ankylosis, the knee being bent at right angles with the thigh. A full report of the case may be found in the *American Journal of Medical Science*, and cannot fail to excite the admiration of the surgeon, would as a brilliant illustration of the triumph of our art.

A free incision being made with the anterior and inferior portion of the thigh, exposing the femur a short distance above the knee, Dr. Har-
sham proceeded with the saw to make an angular bottom of the bone, the apex of the triangle being near the posterior surface, carefully preserving the continuity of its shaft by leaving a thin ledge of the os femoris still attached. The triangular portion being removed, two cut surfaces

of bone were lost, with a ragged increasing in width from the apex to the base of the triangle. These two surfaces were gradually approximated, aided by suitable incisions, and as they approached each other, the leg was extended until the union of the two bony surfaces being accomplished, the limb was brought down to a position occupying very little deformity or inconvenience, and adopting it to all the purposes of locomotion. Complete recovery attended this new and original improvement in surgery.

Dr. J. Keeney Rogers, of New-York, reports an operation for aneurysm of the hip-joint, suggested by the stimulus of Dr. Hunter. "An incision was made down to the os femoris, and this being secured through immediately above the trochanter major. The limb, which had been greatly abducted, was powerfully placed parallel with its fellow. But, as it was desirable to shorten the limb to conform to its fellow, which had been shortened by a fracture, another incision was now made with the saw in the femur, and a wedge-shaped portion removed. The result of this operation was as gratifying to the patient as it was creditable to the surgeon who executed it. Two years afterward he paid a visit to Dr. Rogers to express his gratitude for the restoration of his power of locomotion.

Dr. Guerin, of Philadelphia, has lately performed a similar operation to the second case of Dr. Hunter for aneurysm aneurysm of the knee-joint. This case, which was completely successful, is reported at length in the *American Surgeon* for July, 1842.

FALSE ANEURYSM OF THE KNEE-JOINT.

In the *American Journal of the Medical Sciences* for January, 1843, p. 101, Dr. Harker Chase has given the history of several cases of false aneurysm of the knee, cured by means of rest and gradual extension upon an apparatus with a screw and joint at the knee, similar to those recommended and employed by Mr. Lisson of London, and Dr. Detmold of New-York. The results of Dr. Chase tend to show that in most cases false aneurysm of the knee, with appreciable motion of the joint, is readily curable in a reasonable time without the aid of amputation, and without material pain to the patient. The straightening of the limb has been effected in every instance, and the free use of the joint has been ultimately regained in the majority of cases. It is found absolutely necessary to secure, and the prevention of progress, that the limb, when properly extended, should be retained in that attitude from one to two months before even commencing the passive or voluntary motions necessary to give free play to the articulation. — *Review.*

[ANEURISM. An aneurism may be defined to be a tumour filled with blood, either in a fluid or solid state, usually attended with pulsation, and the seat of which has an opening in it, by which it communicates with the artery, from which the blood is transmitted into it. Celsus defines it "a tumour formed by arterial blood, and communicating with an artery," and divides all aneurisms into traumatic and spontaneous, according as they happen to be produced by a wound, or disease of the coats of the artery. (*De Cognitione et Anore etia de Aneurismo*, p. 6.)

Mr. Cooper has placed the following in his *Annals*:

Since this article aneurism was printed, the artery aneurysm has been tied by Mr. Lisart,

but with the same unfortunate success as had followed all other examples of this operation. Under these circumstances, could the practice be continued? I think not, especially did the evidence in favour of tying the cord.

Subsequently to the period when the article Aneurism was conceived, Mr. Lawson, a skilled vascular aneurism, created very close to the upper edge of the right scapular artery, (the right scapular artery and right axillary artery) aneurism, by which means it was hoped that the aneurism would become completely plugged up with coagulated blood, and the artery would have a better chance of being permanently closed than if a ligature had been applied to the much larger vessel, the axillary itself. The aneurism was made by Mr. Lawson. In fact, proximity to the patient's death had been hastened, on the basis, they show the aneurism, the aneurism before perfectly plugged up with solid blood; the ligature had come away from the vessel, and was found lying loose in the wound, with the two ends of the artery above and below separated by an interval of more than an inch, and permanently closed. The ligature on the artery had not separated, and the rest of that vessel, on the side towards the heart, was closed; and the aneurism had taken place from an ulcerated opening in the vessel of the artery on the distal side of the ligature. My friend Sir Astley Cooper, Mr. Wilson, and some other surgeons of great experience, have noticed also, when secondary aneurism occurs after operations for aneurism, it is most frequently produced by ulceration of the vessel on the distal side of the ligature.

When an aneurismal sac is formed upon a blood-vessel, the walls of the vessel are sometimes thinner than usual; and some parts of them are become expanded into pouches, or even ruptured upon the internal walling, the protruded points being always the thinnest. This kind of case is sometimes termed a *ruptured aneurism*, of which there is a good specimen in the *British collection*, remarkably also as exhibiting an aneurism opening by ulceration into the pulmonary artery. (*See British Ann. of Anom.* p. 55.)

Aneurism, by dilatation is distinguished by Broussais into four varieties, the names of which are distinguished by the differences in the stage of the expansion of the arterial tube. For instance, 1. *The aneurism of the artery*; 2. *The false aneurism*; 3. *The aneurism of the artery*, attended with rupture of the large arteries and the end of the small arteries, or the aneurism by rupture of the artery, and the artery of the artery; 4. *The aneurism of the artery*, or aneurism of the artery. In aneurism of the artery the vessel has at one point of its circumference a small sac, consisting of an expansion of the arterial tube. This variety is least frequent in the artery, but sometimes on the carotid and the artery, and even on those of the brain. In this aneurism, all the arterial tubes are simultaneously dilated; but as the internal and middle coats have but a limited degree of extensibility, the aneurismal aneurism does not generally exceed the size of a filbert, though Broussais has noticed some on the artery as large as a hen's egg. (*See Broussais, de Différence Rapports d'Aneurisme*, p. 12, &c.)

In the *false aneurism*, the dilatation extends over the whole circumference of the vessel; all the coats participate in it. The calibre of the artery, after losing its order and wider

gradually for a certain portion of the trunk of the vessel, then tapered in a narrow equally gradual, till it has resumed its natural diameter.

The cylindrical aneurism of Broussier might be regarded only as a variety of the fusiform, inasmuch as an abrupt transition from a given calibre to a much more capacious one is never observed. Yet, according to the investigations of Broussier, cases present themselves in which the artery is uniformly dilated through a track of one or two feet, the cylindrical form being here strictly preserved. Their pathological fact has been noticed by Broussier in the arteries of the limbs, and in those of the brain and of the cranial cavities. (*Op. cit.*, p. 35.)

In the true aneurism, however, the artery is described by Broussier as being not only dilated, but tortuous, and constantly stuffed with small arterial funnels. The parietes of the vessel are thin and collapsed, while, in the other case, they are rather thickened. Such is Broussier's classification of true aneurisms; a classification which, considering as it does, aneurisms by intussusception and cerebral aneurisms, and those of different kinds, presents a great deal of novelty.

CAUSES OF ANEURISM.

An aneurism will not follow the kind of weakness of its walls which most necessarily arises from removing its external and middle coats, some morbid changes having to be assumed to bring on a protrusion of the inner coat. Neither will a mechanical distention of the tube suffice to lead to an aneurismal dilatation of the future coat. The latter fact is proved by what happens when a tight ligature is placed upon an artery, as well as by the experiments of M. Arnould, who purposely broke the internal coats in numerous places by passing the vessels with forceps, and detaching the inner coats from the outer by a process somewhat similar to what he adopts in torsion of the gutters. By perseverance of this kind, he never succeeded in producing the beginning of an aneurism. The inference therefore is, that some distention of unusual degree in the coats of the artery is necessary for the formation of aneurism, so long as the occurrence is limited by a perfect state of any of those coats; or else the most active of the still more active conditions, that in the experiments undertaken by Hume, Arnould, and others, the laceration of the artery was followed by inflammation of it, coagulation of the blood, and such an effusion of fibrine within and around it as would fully atone for the structural laceration being the result.

One very interesting point in relation to aneurismal aneurism, and particularly observed to by M. Malgaigne, is the almost exclusive restriction of this disease to the aortic system. Thus it is rare that three hundred aneurisms observed by M. Lédér, or recorded by others, be met with only two instances of an aneurismal disease of the pulmonary artery; and these are free from objection. (*Leçons de Médecine Malgaigne, &c.*, par M. Lédér, de Paris, p. 8, 8ra, Paris, 1844.) This remarkable fact is supposed to depend upon the aortic arteries containing between their inner and middle coats, a dense, hard, fragile tissue, very capable of being taken off in scales, and described by M. Malgaigne as the sclerous coat. When aneurisms of different kinds, calcareous, aneurysmal, or catarrhal, present themselves in the aorta, they are meted, according to M. Malgaigne, almost

exclusively to this sclerous coat; a feature not existing in the pulmonary artery or its branches.

Both the external and internal of the same individual were tied in succession by Mr. Tait, one on the 9th of May, 1855, and the other on the 16th of April; and this with entire success, notwithstanding the pentimento was wounded in one of three operations. M. Arnould also took up both the external and internal in one patient, and, though there was only an interval of a week between the operations, the case had a very favourable termination. (*See Volcan, Nouv. Élém. de Méd. Opér.*, t. i., p. 178.)

The operation of tying the internal aorta was also performed by Mr. Thomas, of Bordeaux, who sent the preparation of the parts to Sir Astley Cooper, and it is in the Museum of Guy's Hospital. (*Med. Chir. Trans.*, vol. xvi., p. 230.) A high instance of the application of a ligature to the internal iliac artery took place in the practice of Mr. Hudson, of New-York. (*See American Journ. of Med. Science* for Feb., 1858, vol. v., p. 304.) A small aneurism, seven inches in length, was made, with the economy towards the limb, from the vicinity of the umbilicus to that of the adductor ingu. After dividing the parietes of the aneurism, and tying some arteries, which tied the pedicle, the aneurism was pushed upward and inward, and the handle of a scalpel passed under the trunk of the internal iliac artery, which was tied in such below its origin. The patient recovered.

It is very justly observed by M. Volcan, that the ligature of the internal iliac artery, with regard to its influence on the circulation, is infinitely less serious than that of the external iliac, or even the femoral. In fact, it leaves undisturbed all the vessels springing to the corresponding limb, while the great pelvic arteries anastomose with one another so freely, that, when one is diminished, an abundance of blood is promptly conveyed by the others to the organs which the diminished one is designed to furnish. But the feature of the internal iliac artery is dangerous in another point of view: first, on account of the difficulties in its performance; and, secondly, on account of the unavoidable detachment of parts from one another, which are connected together by a large quantity of loose cellular tissue, a texture in which inflammation and suppuration are disposed to spread to a great extent. (*See Volcan, Nouv. Élém. de Méd. Opér.*, t. i., p. 185.)

On the subject of tying both carotids, I find some interesting observations made by my friend Mr. Casson. "Although (says he) some animals will bear a ligature to both carotids simultaneously, the human frame cannot sustain so great and so sudden an interruption to the supply of blood to the aneurism. Professor Moit has tested this question; and a case came under my own observation very recently, showing the full tendency of a ligature if applied almost simultaneously to each of these arteries. An approximation has, however, been made towards ascertaining the shortest interval at which the second carotid may be tied, others become to the first; and it has been safely done at an interval of thirty-eight, seventeen, and even twelve days. Among the most striking of these cases is that related by Professor Kuhl, of Leipzig, who, on account of a pulsating aneurismal tumour of the scalp, exposing near a wound of the occiput, and extending over nearly the entire surface of the

head, attended by frequent hemorrhages, first placed a ligature on the left common carotid. This proceeding only partially relieving the disease, and frequent hemorrhages from the affected portion of the scalp still occurring, and threatening life, a ligature was put upon the right common carotid after twenty-seven days. This was followed by convulsions; but after a train of very troublesome symptoms, the patient recovered, and was cured of his disease. It is worthy to be noticed, that in this, and also in other like cases, some days after both carotids had been tied, heaviness and throbbing in the head have occurred, requiring free evacuation." (*J. Med. Assoc. Trans.*, vol. 9.)

Guthrie has met with but three popliteal aneurisms in women; and he calculates aneurism of the limb occurs both twenty to thirty times in men for once in women. "The structure of the vessels (he observes) is the same, but the mode of life is different. The operation in general is infinitely greater in the man than the woman; and I think this, combined with the first use of arterial spirits, a much more salutary course than either aphlebia or mercury." (*On Dis. of Arteries*, p. 75.)

In relation to the comparative frequency of aneurism in the two sexes, M. Liston states that, in 134 cases, the particulars of which have been collected by him, and whose attention he directs them within the reach of operative surgery, the proportion of male patients was 10; of females 24, or nearly 11 to 1.

With respect to the comparative frequency of aneurism in different arteries, M. Liston refers to 179 cases, all aneurisms; those of the parts not entering into the computation, from which 179 cases he gives the following table:

1. Popliteal artery	59
2. Femoral $\frac{1}{2}$ in the groin	26
3. Carotid $\frac{1}{2}$ at below points	16
4. Cerebral	17
5. Subclavian	14
6. Axillary	14
7. External iliac	5
8. Brachiocephalic	4
9. Brachial	3
10. Common iliac	3
11. Anterior tibial	3
12. Gluteal	2
13. Internal iliac	2
14. Temporal	2
15. Internal carotid	1
16. Ulnar	1
17. Peroneal	1
18. Radial	1
19. Palmar per	1

[Dr. Valentine Mott, of New-York, has tied the common carotid artery twenty times. In two cases it was the distal operation for aneurism of the internal carotid, and in one of these was successful. In these instances he has thus cured aneurism by anastomosis. In two examples both of the common carotids were tied in the same patient; in the first case, the interval between the application of the two ligatures was about twenty minutes, the patient dying suddenly on the second day after; in the second case, a year elapsed between the first and second operations. This case was a large aneurism of anastomosis, occupying the temporal and parotid regions, extending deep about the articulation of the lower jaw. In the removal of the parotid gland, Dr. Mott found it necessary, in one case, to tie the external carotid at the point between the styloid

muscle and the larynx nerve, an operation the difficulty and hazard of which every surgeon will know how to estimate. The same surgeon has repeatedly tied the external carotid over an artery in his operations for aneurism.

The same surgeon has also tied the subclavian four times; once within the axillary vessels of the right side, three from secondary hemorrhage; three times within the axilla, all successful in curing axillary aneurism.

Dr. Mott was the first surgeon in the world who successfully tied the common iliac artery, and this year for a large aneurism of the external that near the femur. Dr. Severance, of St. Petersburg, has since performed it with success.

This operation was performed by Dr. Mott on the fifteenth of March, 1827, and the case reported soon after in the *American Annual*, No. 1, p. 156. Nearly seven years afterward, the *Medical Champion*, Review announced the successful result of the case in which Mr. Guthrie applied a ligature to the same artery, and the same result, pleasantly observes.

"Thus this most formidable aneurism has been successfully performed for the first time, and while it adds a strength of belief to the views of the distinguished surgeon, it constitutes a splendid triumph of British surgery."

Dr. Hays, of the *American Journal*, in republishing this number of the *Lancet* reviewer, remarks that this "triumph of British surgery" belongs to this side of the Atlantic, and that it has placed the surgery of aneurism not distant to write their. He then adds, "The distinguished surgeon to whom the British public belongs is our colleague and countryman, Dr. Mott, who, upward of seven operations, successfully applied a ligature to the common iliac."

The British reviewer, again, in regard to remarking that this "successful" operation of Mr. Guthrie was very well tied, and he strongly fails to record the fact that the aneurism for which Mr. Guthrie tied the common iliac turned out to be a malignant fungus, which the operation decided to be aneurism, and the patient was dead, when the mistake of his position was discovered. This record, however, would have withered the wreath of laurels upon the brow of Mr. Guthrie, and deprived British surgery of this splendid triumph.

Fifteen years have now elapsed since Dr. Mott's operation, and the progress is still going. And yet Mr. Guthrie himself, in his work

"On the Diseases and Injuries of Arteries," p. 265, records this case of Dr. Mott as lost, although he extracts his account of the operation from the *American Journal*, in which the same statement of the patient to which is again mentioned.

Dr. Mott has also tied the external iliac six times; of these, five were successful, and one failed. The first of the four cases was from secondary hemorrhage, but the second died of pneumonia, from drinking to excess shortly after the operation. He also tied the internal iliac in 1831 with success, for a large aneurism in the region of the sciatic notch, and the patient is still living in perfect health.

Dr. Mott has tied the femoral artery five times, and in only one instance has secondary hemorrhage taken place. In this case the patient had a popliteal aneurism, and, after the failure of the ligature on the femoral artery, he secured the external iliac; but, on the evening after of the ligature, secondary hemorrhage

again occurred, and was ultimately fatal. This was a fair case for tying the artery, and Dr. Mott was only concerned by the marked stage of the arterial by-pass, as was ignorant in the result of the two ligatures, which had been successfully only on this account.

Dr. Mott has noted one of my citizens of a double aneurism, confined to the thoracic and femoral on the other very high up. He told for the femoral the femoral artery, and on the latter the external iliac. The patient is still living in New-York, and in prime health. The same surgeon has tied the tracheal, vena, renal, uterine, and posterior tibial for wounds, tumors, and other, renal disease a great number of times with uniform success.

The left primitive iliac artery was tied for aneurism of the external iliac by Dr. Alfred C. Post, at the New-York Hospital, on the 25th of August, 1844. The case terminated fatally. An account of it is published in the New-York Journal of Medicine and Surgery, October, 1844.

Dr. George McClellan, of Philadelphia, tied the common carotid three or fifteen times for aneurism and tumors. He has also successfully tied the subclavian three times, the external iliac three times, and the glenoid once.

Dr. N. K. Smith, of Baltimore, has tied the subclavian artery, the external iliac, the carotid three times, and the femoral eleven times for aneurism. The same surgeon has had occasion to tie the internal jugular vein, which he effected successfully, and the patient recovered.

Dr. Allen Goldsblith, of New-York, has tied the subclavian twice the axillary artery, and in one of the cases he has had entire success. He has also tied the carotid three times for aneurism by anastomosis, which was cured, and for tumors, which were afterward successfully extirpated; but he declares in the opinion that tying the vessel does not remove the blemish. In such operations, aneurism never reformed.

Dr. Penco, of Philadelphia, has successfully tied the external iliac for aneurism in the Pennsylvania Hospital.

Dr. Penco, of Philadelphia, has had occasion several times to take up the carotid artery in cases of aneurism at the neck by cutting the throat. He has observed that, in these cases, where there is much enlargement of blood supply the parts, the dissection need not be so large as when the vessel is not so large, and that the procedure will depend on the size of the vessel.

Dr. Penco has devised a method for the purpose of tying the subclavian artery below the clavicle, which will render the operation less difficult upon the living subject. He opens the space between the axilla and clavicle, and then divides the pectoralis major muscle, and then divides the external pectoral artery, and ties the clavicle over the artery. He then brings the divided portion, and holds for the artery beneath.

He has operated the same for aneurism at the base of the arm by tying the axillary artery with a small ligature just below the axilla, and below where it is crossed by the median nerve, leaving the nerve undisturbed. The cases were all recent, and the operation successful. In some cases, which are of long standing, he attempts to open the sac and apply two ligatures.

Dr. P. has also taken up the femoral artery twice with success for popliteal aneurism. He has also tied the stylo-mastoid artery for false aneurism, recovered by ligature. The patient

was a quack doctor from the West, who tied himself, and was in the habit of bleeding his patients at the carotids. The neck had burst, and aneurism had taken place. A single ligature effected, but the operation must be a difficult one, when we remember the proximity of the communicating branches of the facial and great auricular nerves, which are parallel with the stylo-mastoid artery opposite the lobe of the ear.

Dr. Deane, of New-York, has recently tied the common carotid for aneurism by anastomosis, involving the whole side of the face in a lady who was thirty-eight years of age, and at the time the aneurism was very rapidly increasing. The growth was checked immediately, and the aneurism is fast closing, and of the nature of the aneurism of the difficulty will be the result.

Dr. N. E. Smith, of Baltimore, reports a case of temporary paralysis following a ligature upon the external artery. As this aneurism result did not occur immediately, but after an interval of some twenty hours, and as it was relieved, and the patient recovered by full restoration, the aneurism was attributed to the weakness of the vessels not destroyed, giving rise to muscular degeneration, and was indicated to be the true pathological state by the symptoms. (See *Medical and Surg. Jour.* for 1845.)

Dr. McCreary, of Cincinnati, reports a case of aneurism of the carotid artery, situated with the artery, and for which he tied both of the common and primitive trunks, after an interval of twelve days. The distention of the carotid and expansion of pulsation, which induced a severe hope of success, proved to be but temporary, and six weeks after he was obliged to expose the whole mass by an incision around its base, and which exposed forty ligatures. The patient completely recovered. (See *Amer. Jour.* for 1838.)

Dr. Harvey, of Philadelphia, has published in the American Journal for 1841 an accurate and highly valuable report of two cases of aneurism, exhibiting the necessity of a ligature both above and below the tumor.

In the American Journal for 1837, Dr. Morris, son of Thomas Ayres, reports six cases of aneurism cured by operation, the details of which are honorable to this surgeon, who was graduate of the University of Maryland, and his paper will be found to be highly interesting to the student of this branch of surgery.

Dr. V. S. Kirkbride reports, in the American Journal for 1838, five cases of aneurism of arteries successfully treated by compression, illustrating the important fact that aneurism is often tied for spontaneous aneurism, when compression, judiciously applied, would succeed in preventing the necessity of the operation. In this way he has tied aneurism with the radial, femoral, and femoral arteries; and, after reporting the cases, Dr. K. adds practical observations on the general subject which are of great value.

Dr. J. R. Forster, of Philadelphia, has long distinguished himself in the department of treating vascular diseases by other means than the use of the knife, fully regarding the avoidance of an operation as more meritorious than the ligation of any artery of the body. So also in those cases and lesions for which amputation is often practiced, Dr. Forster's horror of amputation patients has led to the employment of his energy and skill in preserving the limbs, even when more difficult operations than amputation are indicated.

ted as necessary for the purpose. Under the head of Aneurisms I have alluded to an eminent instance of this variety.

In the *Ecliptic Repository*, vol. i, p. 203, Dr. Joseph Parry reports a case of femoral aneurism spontaneously cured. His son, Dr. Isaac Parry, relates a case of aneurism in the orbit, in the *Amer. Journ.* for October, 1810.

Dr. Paul F. Levy, of Georgia, has lately succeeded in curing an aneurism of the neck resulting from a wound of the brachial artery, made by transfixing the vein in phlebotomy. In this case the artery was ligated above the tumour without success. Six minutes afterwards Dr. Levy tied the artery on the distal side of the aneurismal tumour, but this operation, also failed, and the pulsation of the tumour continuing, he was led to treating the aneurism by placing two ligatures upon it at opposite points, and by this operation the tumour was completely obliterated.

Dr. Alexander E. Howard, of New York, has devised an instrument in which dissection is effected, which practical men regard as possessing great merit. An account of it may be found in the 2d vol. of the *N. Y. Med. and Phys. Journ.* with a drawing. The advantage of this instrument is, that after tying the first knot, the second may be brought down without disturbing the first, as there is no stress upon the ligature between the two. It has been found to afford great facilities in ligating the internal iliac, and abdominal aortae. See White's operations for pulsed aneurism, in the *Amer. Journal* for 1827, and also Dr. Gross's case, and remarks on the abdominal artery, *Western Journal* for 1841.

Dr. J. Keeney Rogers has tied the external iliac, the internal iliac, and the femoral in the same patient, for complicated aneurisms.

Under this head I have introduced into the text the only instance of the ligature of the internal iliac for the cure of pulsed aneurism ever performed in this country, as communicated by Dr. S. Percey White, of Hudson, N. Y., and it is there stated to be the fourth instance in which this operation has ever been attempted. I find, by a late number of the *Lancet* Gazette, that Dr. Thompson, of Manchester, has since performed this difficult operation, but without success, as would seem from the fact that a preparation of the parts has been sent to Sir A. Cooper, and is now in the museum at Guy's Hospital. So that this artery has now been tied five times; twice in the West India case in Russia; once in Great Britain, and once in the United States.

Dr. Steyens, of St. Cuth, was the first to attempt this hazardous operation, as may be seen by a reference to the article in this Dictionary. This case occurred in 1812, and was completely successful. The patient lived ten years after the operation, and, dying in 1826 of some other disease, an opportunity was afforded of examining the parts. "The preparation was sent to London to remove the skepticism of those who persevered in declaring the operation impossible. Still, however, a few distinguished men doubted the reports of the several cases, and Mr. Lawrence, in his lectures, still questioned the possibility of tying the internal iliac; and alluded to only one case in which it was said to have been performed. (See *Lond. Med. Gazette*, No. 124.)

During the present year Dr. Stensen visited London in the suite of the governor-general of the Danish West India islands; and having his attention called to the aneurism of Mr. Law-

rence, he immediately sent the preparation, which had been in London unstopped for several years, to the Royal College of Surgeons, where, in the presence of Mr. Lawrence, a minute examination was made, to the entire satisfaction of all present. It appeared, however, that the aneurism was not in the glided artery, as had been supposed, but in the great intestine; and Dr. Stensen suggests that this is probably the seat of the disease, in many instances, of what has been called glided aneurism.

Sir Astley Cooper has given a circumstantial account, after having carefully examined Dr. Stensen's preparation, which is also published in the *Gazette*, declaring himself perfectly satisfied of the existence of the aneurism, and the complete obliteration of the internal iliac. For, although this preparation has been in spirits eight years, "it still exhibits the internal iliac converted into an imperious chord whose ligature was applied, and whose very distinctly the pulsation of the aneurismal swelling in the external artery."

In the *Western Journal of Medicine* and Surgery for June, 1841, Dr. S. D. Gross, professor in the Louisville Medical Institute, reports a case of aneurism of the artery for which he tied the right subclavian artery. The patient died on the third day of the effusion of the contents of the aneurismal sac into the thoracic cavity, which had obviously resulted from ulcerative absorption of the walls of the tumour, and before any management before the operation. But for this untoward event, which success would have crowned the operation, for the ligature came away in due time, and the wound did well.

Dr. Gross relates the history of twenty-two cases in which this artery was tied, of which aneurisms were cured. He records three instances in this country, the first by Dr. Post, of New-York, in 1817, successful; the second by Dr. Gibson, of Philadelphia, in 1828, the patient dying on the eighth day; and the third by Dr. Mott, of New-York, in 1830, in which the patient recovered. So that it appears that in America the first instance of aneurism on record was furnished by Dr. Post; for, until his case, it had sided in the hands of Ramsden and Blinck of London, and Dr. Colles of Dublin, the only instances of this artery being previously tied. Thapsimus was the next to succeed, which he did two years after at the Hotel Dieu of Paris. The paper of Dr. Gross is an elaborate and meticulous criticism upon the whole subject, and does him great credit.

In the *Ecliptic Repository*, vol. iii, p. 223, Dr. Joseph Parry, of Philadelphia, has a paper on the application of a ligature to the abdominal artery, with description of instrument.—Hence.

[ANTRUM. COLLECTIONS OF MIST.]

In general, I believe that the extraction of one of the molar teeth will not prove very applicable to the present case. First, because the thick alveolar bone that requires a larger opening than can be thus obtained; and secondly, because, when the surgeon is called upon to perform an operation, the bony texture of the antrum is already very thin, much softened, or even partially dissolved above or behind the jaw, consequently, as easy as the surgeon has made an incision above the gum, or at the part of the swelling protruding itself on the roof of the mouth, he feels that a pulse will immediately follow the incision. All that he has to do, therefore, is to enlarge this opening with a pair of small bone-force, or a

strong knife. Mr. Hunter's apprehensions, respecting the difficulty of manipulating the opening, and of the likelihood of a return of the antritis, does not appear to be confirmed by what happened in the cases under Hunter and Sir Benjamin Brodie. The latter surgeons, as they, never dissecting the membrane of the cheek from the jaw, I think a curved scalpel, bent laterally, with a strong sharp point, and introduced the point into the angle of the thin fleshy part, or boundary of the tumour - immediately there escaped a large quantity of transparent fluid, like what we find in cases of antrum. I then introduced a probe into the cavity of the antrum, and found that it might be passed in any direction. There was neither tumour nor pain seen in it, and the cavity seemed to be in a natural state, except that it was somewhat dilated. I next enlarged the opening, cutting out a circular portion of this fleshy shell, formed by the expanded portion of the antrum. After the operation the tumour subsided, and in a few weeks the cheek was not larger than the other. The operation made by the scalpel has contained pusiveness this day, though it is ten years since I performed the operation. The lady wears a plug, which she takes out night and morning, and with her own hand introduces the point of a syringe, and washes out the antrum. (See *Lond. Med. Gaz. for Dec.*, 1834.)

APPROACHES TO THE ANTRUM.

The following way of making the opening is recommended by Sir B. Brodie: "Raise up the cheek, so as to expose the membrane covering the sinus on the side of the face, and with a scalpel make a transverse incision over the sinus. In one case (says Sir B.) I did otherwise, thinking the division of the membrane, not a separate part of the operation, was unnecessary; but the consequence was, that the blood escaped into the cellular membrane underneath, and there was an immense ecchymosis, producing the rest of the operation very difficult. Then perforate the thick plate of bone as nearly as possible to what you suppose to have been the original seat of the disease." The best instrument for this purpose, according to Sir Benjamin Brodie, is a pair of sharp-pointed strong scissors. "Apply them to the bone in their closed state, using them as a shisel, and they will easily penetrate it, and go into the antrum. With these the bone may be easily broken down to the requisite extent." (See *Mé. de l'Acad. de Chir.*, t. vi., p. 35; *Graaf's Diss. Append.*, p. 138.) Some surgeons, when it is absolutely necessary to expose a great part of the surface of the bone, and to cut away the dead species, which are wedged, as it were, in the living ones. In general, however, it is prudent to wait till the dead bone is loose, and in the mean while to restrict our interference to preventing the lodgment of matter, and rejecting any effluvia.

TUMORS IN THE ANTRUM.

Surgical writers describe polypus of the antrum; and as growths of this kind have their origin from parts invested by mucous membranes, it is natural to expect that the antrum would occasionally be the situation of them. Yet this disease must be very rare; and Sir Benjamin Brodie even regards the history and treatment of polypus of the antrum as altogether hypothetical; and he adds, "No polypus, I believe, ever existed in the antrum external to the antrum

could join a ligature; and I never heard of the operation being performed." (See *Lond. Med. Gaz.*, for Dec., 1834, p. 438.) In an hospital, either civil or military, have I had an opportunity of seeing a polypus of the antrum; neither has any case presented itself to me out of an hospital. I join Sir Benjamin Brodie, therefore, in believing the disease to be exceedingly rare. There are, however, some good authorities in confirmation of the fact that polypus sometimes grows in the antrum. (See *Grav. Chelms. Diss.*) Certain other remarks, respecting whether the antrum, and the nasal cavity, some of which are of a fibrous, cartilaginous, or osseous, or cartilaginous character, free from malignancy, while the others are of a malignant character, participate of the nature of medullary tumours, or of sarcomas, and sometimes of both these formidable diseases together. Malignant tumours are attached to the antrum sometimes, and fill up the cavity. At first the patient has but little pain, and the existence of the disease is scarcely indicated by any particular symptoms. But, as the disease advances, things are different. The tumour, growing larger, presses upon the inferior part of the antrum, and causes the bony portion to become dilated. By degrees, it forms a projection in the cheek. After a time, there is another projection in the bony palate. Then another projection occurs at the inferior part of the orbit; and there is still another blocking up the nostril. Then the pressure of the tumour, the osseous portion of the antrum is absorbed; the alveoli are destroyed; and the teeth are loosened, or drop out. At length, the medullary growth, making its way up the orbit, displacing the eye, and then passes through the orbital plate of the frontal bone into the skull, and forces fatal, or else it penetrates through the front, or lower part of the antrum, in either of which last situations it presents a large fetid, bleeding mass, bringing the patient to his doom with rapid certainty. In the Museum of London University College are three specimens of malignant disease of the antrum: in two, the swelling made its way from the antrum to the brain; in the third, which was taken from an elderly woman, a patient of mine, who died in the North London Hospital, the medullary and osseous mass, after entering the orbit and displacing the eye, caused liberation and sloughing of the cheek, and a protrusion of scalp of the thumb in this direction. The woman, who had several indolent ulcers from the pressure of the tumour, as it continued to enlarge, was at length worn out by the discharge, irritation, and repeated bleedings from the disease. I remember a boy in St. Bartholomew's Hospital, many years ago, in whom a medullary tumour, beginning in the antrum, made its way through the orbital plate of the frontal bone and entering the plate of the ethmoid into the cranium. He was only counted about forty-eight hours before he died, though the portion of the swelling projecting into the cranium, and causing a corresponding depression in the integuments of the bone, was not in size to a small nutmeg.—C.]

This article under this head, I inadvertently omitted to record a new and difficult operation performed for the removal of a fungus from that cavity, by Dr. A. H. Stevens, Professor of Surgery in the University of New-York. The details of the case are included in Dr. Steiner's Appendix to Velpeau's Surgical Anatomy, recently published. It is the more important I

should introduce it here, since in another part of this work I have alluded to Dr. Rogers the more of having first operated in this country for the removal of the upper jaw. Dr. R.'s operation was performed, it will be perceived, in May, 1824, while that of Dr. Stevens was in August, 1823. I was led into this error, as respects the date, by the circumstance that the latter operation was not published until the present year, the author having withheld the report of the case from the public from a desire of delicacy to the patient and his friends, but the individual should be identified, and the extent of the mutilation shown.

The tumor in this case occupied the whole anterior aspect of a broad base from its lower portion, and occasioned a great deformity in the cheek, and protruded from the mouth.

For the full account of this singular operation, I must refer to the work just mentioned. It will be sufficient here to state, that a great portion of the anterior and inferior portions of the os maxillare superius were removed without dividing the cheek, by drawing up the commissure of the lips, and dissecting the upper lip from the bone to within a line of the infra-orbital foramen. And the portion of the operation is in the manner of raising the lip by a flexible elastic rod, made of iron-spring instead of the use of the nail, chain, and pegs, and the still more painful and equivocal operation with the actual cautery.

This patient is now living in perfect health, and the cavity in the cheek which followed the operation has been filled by an artificial jaw, made of ivory, having teeth attached to it, and the articulation and deglutition are so perfectly restored, that only a few friends are aware of the nature of the operation to which he has submitted.

This entire though of not so severe a form of a disease is alike honorable to Dr. Stevens and the profession.

Professor Chapin A. Harris, of Baltimore, has reported in the *Maryland Med. and Surg. Journ.* for 1840, a highly interesting case of cancer, to which I must refer the reader, as of great practical importance. It was cured by the extraction of the first superior molar tooth, the roots of which were found greatly enlarged by cancerous action. This operation was found to have opened the system, and allowed the escape of a purulent and foetid discharge, and indicating the proper treatment, as well as revealing the true source of the patient's suffering. The patient was thus restored to health after being tortured by scrophulous for years.

Dr. Warren, of Boston, has reported in the *Boston Med. and Surg. Journ.* for 1839, a case of fungus of the gumma, of so great extent that the nasal cavity, and what were supposed to be the common cavity by the destruction of the bony structures, and which required the removal of the upper jaw, signified the miller bone. The patient, speedily relieved thus, had a complete mutilation, so desirable to the surgeon who thus rescued him from a horrible death. See Dr. Warren's work on Tumors, and Impetigo Jephson.—Rohrk.

[ANUS.—PROLAPSE AND]

In the treatment of a child, Sir Benjamin Brodie recommends occasional purging with calomel and rhubarb; the prohibition of such vegetable food, which tends to fill up the intestines,

while it affords but little nourishment; and an injection, every morning, of two or three ounces of a lotion composed of ʒi of ether, four ounces of water, and a pint of wine. The child is to retain the injection as long as possible. Sir Benjamin Brodie has never seen a prolapsus of the rectum in a child which was not cured in this manner.

ARTIFICIAL ANUS.

The following general directions were given by Dupuytren for the application of his *Artificial anus*.—1. The two ends of the bowel must be exposed. 2. The septum between them divided. 3. The external opening fixed up.

The lower end of the intestine he frequently found very difficult to make out. In old cases, very often, neither the sigmoid flexure nor the lower portion of the bowel could be discovered; and it seems as if there was only one passage leading to the rectum. The other, particularly in new and enlarged within the belly, has in general so concealed, that, unless accidentally aided by a probe, its detection is almost impossible. Then the relation of the two portions of intestine to one another Dupuytren found remarkably constant. The stenotic point, according to the kind of case, may be superior or inferior, external or internal. When the superior was especially enlarged was the great obstacle, he sometimes found among the best means of discovering the orifice of the lower continuation of the intestinal canal. In very difficult cases, he sometimes the use of a plug, purgative clysters, and a very small diet. (See *Cancer Glor.*, t. 2, p. 265.)

The two ends of the bowel being exposed, the operation must not be performed if the enormous cost of the bowels, the peritonitis, or other organs be the seat of acute or chronic inflammation. The patient is to be prepared by a suitable, mild, antispasmodic plan.

In the operation the patient is to lie upon his back.—The surgeon takes one of the branches of the extensor in the right hand, and pushes it, if requisite, with the left forefinger to one of the orifices of the bowel to the depth of two, two, three, or four inches, according to circumstances. An assistant then takes charge of this first part of the instrument. The other branch is then introduced into the other end of the bowel in the same manner.—Both branches are then brought together, and joined like a pair of dividers. The blades are then made to grasp the bowel by pressing the handles together. The pressure is next regulated and maintained by means of a screw. Before the expiration of the first day the pressure is to be increased sufficiently to kill the portion of intestinal tube embraced by the instrument, and the pressure is to be continued every second day to render these dimensions still more certain. In the cases under Dupuytren, the instrument was detached between the seventh and tenth day, being removed with it the distending padding sponge and septum, which prevented the upper portion of bowel from communicating with the lower. Frequently the first signs of the re-establishment of the natural process precede the detachment of the instrument. In all cases slight recte occurs, the evacuations are at first white and slimy from the lower bowels, and these are followed by stercoraceous matter from the upper ones. As long as the contents are liquid, and mixed with mucus, and they soon become of better quality, and all unpleasant sensations. (See *Dupuytren in Clin. Chir.*, t. 2, p. 294, 295.)

FISTULA OF THE ANUS.

As they are termed, consist of large superficial ulcerations near the anus, between the converging folds of the true skin and mucous membrane. When the folds of the anus are separated, and the fistula is deemed to straddle, a narrow fissure is seen, the bottom of which is red, and the margins somewhat swollen and callous. But in Dupuytren's observation, it is frequently necessary for the purpose of ascertaining how high it reaches, to introduce the finger into the rectum. It is much more highly situated at the sides and back of the anus, than at the forepart of it; a favourable circumstance is relative to its operation, particularly in women, in which the opening is divided from the posterior column of the vessel only by a thin partition. The inflammation chiefly affects the whole thickness of the mucous membrane. (See *Dupuytren, Clinique Chir.* t. ii., p. 223.) Fissures of the anus are usually productive of violent lancinating or burning pain, which gradually augments, and lasts a considerable time after the patient has had a motion. In some cases, indeed, so extensive is the suffering, that the patient feels a dread of obeying the call of nature, so long as possible, or even usually starts himself, to render the operation for emptying the rectum less frequent. The severity of the case arises chiefly from a painful spasm of the sphincter muscles.

Constipation, and the spasm which it excites, are among the predisposing causes of fissure of the anus. The indurated fecal matter, either by raising ulceration of the mucous membrane, or by immoderate distension of the passage, may bring on the complaint. The unskilful administration of clysters, especially with pointed rough tubes, is often the cause. Persons of the anus are frequently met with in persons who have piles; and, according to Dupuytren, the lodgment of viscid matter near the anus, as happens in many women, may lead to the complaint. Perhaps it would be more correct to say that the contact of any irritating matter of secretion may give rise to it.

According to Dupuytren, the spasmodic constriction of the sphincter is the real disease, and the fissure is only a secondary effect. By putting a stop to this constriction the disease is cured. With this view, Dupuytren tried what good could be done by the following operation: R. *Aloësis* ʒss., *extr. belladonnæ plantif. rectif.* ʒss. Mac. A pint of limon-champagne, or as I should say, a soft rectum bougie, of moderate size, smeared with this ointment, is introduced, and the diameter gradually increased to that of the forefinger. Dupuytren states that the continuance of this treatment for a few days frequently cures the pain entirely, and dissolves all tendency either for cicatrix or the division of the sphincter. Even when the plan does not cure, it always palliates, and therefore should be tried before the latter method is resorted to.

Bacon Dupuytren makes a very useful and practical division of fissures of the anal into three kinds. *First* are those the sphincter, affecting hardly any thickness of the skin, and not the mucous membrane. These excite more or less pain, but cause little obstruction to the passage of the feces. *Second* are the sphincter, involving the mucous membrane, and only to be seen with the aid of a speculum. When the finger is passed into the rectum, a knotty hard chord is felt, and pressure well creates acute pain. When

the patient goes to stool, such fissures give rise to an intolerable sort of stinging, which ceases directly after the evacuation; and the expansion of the soft segment the fissure is covered with puriform or mucous, bloody fluid. Such fissures were found by Dupuytren to be essentially produced by the distension of internal piles, excited by the passage of indurated fecal matter. Lastly, fissures of a *third* kind, *third* are, not the worst, being attended with agonizing constriction of the sphincter, and other symptoms already specified.

The first two descriptions of fissure may often be cured without any operation; some by the fissure itself with simple means, of constant exfoliating action, mucous preparations, for others by emollient anodyne lotions or applications. But when the fissure was of the third description, Dupuytren considered the operation first introduced by Borel the quickest and most certain mode of cure. This consists in dividing the anus and sphincter with a probe-pointed bistoury, passed into the rectum, and cutting directly through the fissure, except when it lies forward towards the vagina in the female, or hymen in the male subject. When several fissures existed, Dupuytren sometimes made several cuts in different directions, from those to five lines deep. (See *Clin. Élec.* t. ii., p. 10.)

PRETERNATURAL CONTRACTION OF THE SPHINCTER.

Sir Benjamin Brodie has treated of this as a distinct affection, and, indeed, we find that Dupuytren represents it as being generally the primary complaint in fissure of the anus. The cases referred to by the former gentleman he has met with chiefly in women disposed to hysteria, though sometimes in the male sex. In emptying the rectum, the patient is obliged to strain very much, especially when the feces are solid; then pain is experienced, which lasts a considerable time afterward. Very often a small ulcer of the mucous membrane of the rectum (the second variety of Dupuytren's fissure) accompanies spasmodic contraction of the sphincter, and is always, according to Sir Benjamin Brodie's description, situated at the posterior part, opposite the point of the os coccygis. When the suffering is not excessive, relief may sometimes be derived from purgatives, given to prevent the evacuations from being hard and dried, from an opiate suppository at night, and from the introduction of a bougie into the anus just before the patient has a motion. In worse cases, Sir Benjamin Brodie recommends the division of the sphincter with a straight probe-pointed bistoury. The *first* of the vessels are thick, and will require two or three strokes for their complete division. An anæsthetic may be given to keep the bowels quiet for two or three days afterward, with a diet of water or may be exhibited. Simple dressing will suffice to heal the wound. (See *British Med. Gaz.* for 1833, 1835, p. 36.)

EXCERIMENTS OF THE ANUS.

These cases are frequent, the growths resembling a variety of names, according to their supposed resemblance to things, as condylomata, excoriations and &c. Some are much firmer than others; some of them grow in consequence of irritation of the skin of the anus, by the contact of rural secretions or putrid matter. Others are originally piles, for, as Sir Benjamin Brodie observes, often the ravages of external piles be-

cornea obliterated, their generally firm flaps of skin, which gradually waste; but sometimes diseased action takes place in them, so that they become converted into excrescences similar to those which grow from the nymphs of women. Many observers share the mistaken perception of a middle existence, between that of a wart and that of a polypus. I have observed great number by stimulating applications, as the nitrate of silver, the zinc sulphate, the acetic acid, and the powder of yarrow, blended with carbonate of copper, or a solution of the sulphate of copper. When their tegula have been removed, I have also extirpated many of them with large forceps. But, in general, I remove the larger kinds with a bistoury. The bleeding, which may be at first copious, does not generally require a ligature, as it stops as soon as wet or linen dipped in cold water, and a T bandage has been applied. (See *Fluorazentis and Barytes*, p. 45.)

[Dr. J. C. Warren, of Boston, has cured twelve cases of fungus of the eye. In three of them he resorted upon exclusive medicines and the local application of the nitric acid; but in nine of them he found it necessary to divide the sphincter with the knife.]

The late Dr. George Swale, of New-York, published in 1847 a treatise on the malformations, injuries, and diseases of the rectum and anus, which will be found to possess very great practical value. It is composed in some three hundred octavo pages, and accompanied by nine quarto plates.

In Professor Gibson's late work on the Institutions and Practice of Surgery, vol. ii., p. 140, a just encomium will be found upon Dr. Physick, of Philadelphia, for his ingenuity and successful operating for artificial anus formed by him in 1808, and afterward imitated, with similar success, by Dupuytren of Paris. The claim of Dr. Physick to priority in this surgical achievement is fully sustained by Dr. Gibson, by an extract from Dr. B. H. Coates's able paper on the subject, published in the *N. A. Med. and Surg. Jour.*, vol. ii., p. 360.

Dr. J. R. Letz, of New-Berlin, Pa., has successfully operated by a method which he considers an improvement on both Physick and Dupuytren. (See *Amer. Journal*, No. 38, p. 367.)—*Review.*

[AORTA: COMPRESSION OF THE AORTA.]

In order to restrain hemorrhage from the anterior half of the body, more especially from the uterus, has been warmly advocated, and in this purpose seems calculated to be beneficial. (See *Grover, Provincial Med. and Surg. Trans.*, vol. 5.) I have mentioned the adoption of this plan by Sir Astley Cooper, in the case where he operated the aneurism, and previously to putting a ligature on the aorta.—C.]

[ARSENIC. Dupuytren was in the habit of employing certain preparations of arsenic, which claimed the diseased surfaces without destroying them. One of his formulae was a powder, the other a liquid. The arsenious acid constituted the basis of both. The calomel, joined with it, he conceived might have some effect, but the arsenic was the essential thing. The powder consisted of two parts of arsenious acid and one of calomel, and thirty-six of calomel. Something the proportion of arsenic was increased to five or six parts in the hundred. The liquid preparation was principally the above powder mixed with gum arabic, and sweetened with distilled water,

so as to make a paste. In the latter formula, however, Dupuytren usually increased the proportion of arsenic, employing six, eight, ten, or twelve parts of arsenic with an equal part of calomel, as made, with the arsenic, one hundred. Dupuytren employed this application with considerable success for the cure of many phagedenic ulcerations of the lips, and other parts of the face, approaching almost to cancer in respect to duration. (See *Chirurg. Cas.*, t. iv., p. 471.) In the North London Hospital I employed Dupuytren's arsenical powder last year, in one or two instances of the same kind, with complete success. In leprosy, or cutaneous cancer, it is a valuable application.

If the pump be used, Dr. A. T. Thomson is of opinion that lime-water should be used to wash out the stomach. The union of this and arsenious acid forms a nearly insoluble salt, so that, while we are treating the stomach with arsenious extract, we are also lessening the risk, in case of any part of it which may remain. If the above remedies be given, lime-water should be drunk immediately after the last dose of arsenic. Oil, and also milk, may be given, but no strong fluid calculated to dilute and remove the arsenious acid. Alkaline solution are absolutely contraindicated, the alkaline acetates are very active, and as potash, are as caustic as lime. (See Thomson's *Elements of Therapeutics and Materia Med.*, p. 518, ed. 2.)

In 1838, the peroxide or bromised starch of iron was discovered by Dr. Bence to be a general antidote if administered in time. (See *J. of Chem. in Pract. Med. Trans.*, vol. 3, part 2, *J. Review in Lond. Med. Gaz.*, Nov. 5, 1838.)—C.]

[ARTERIES. In the article Aneurism I noticed the questions about the propriety and safety of tying both carotids, and whether this could be done without extraordinary risk when no interval was left between the two operations. With respect to these points, I find that M. Harter is decidedly of opinion, that both the common carotid arteries may be tied at once in the same individual, without any marked or lasting derangement in the functions of distant parts of the head. He believes that the numerous anastomoses which exist in the interior of the skull between the terminating branches of the vertebral arteries and those of the internal carotid, are more than sufficient for the easy conveyance of blood from the former into the latter, and for the prevention of the brain from being sensibly affected by the obliquity of the two common carotids. Externally, the numerous communications between the branches of the external carotids and those of the two subclavian arteries, more particularly the free anastomosis of the lower thyroid with the superior thyroid arteries, and those of the ascending cervical with the occipital arteries, have no doubt in M. Harter's mind respecting the correctness of the opinion which he has advanced. He has frequently tied both the common carotids in animals without the slightest impairment of their intelligence or of their general health. At the period when he was recording his views of the subject, there was in the dissecting-room of the hospital a large, strong, healthy dog, on which he had performed this operation five years previously, and whose intelligence continued perfectly undiminished. So far continued in M. Harter's view of the safety with which it may now be practised on the human subject, that he wished to undertake it on a younger man who had an an-

lympe tumour of erectile union on the feet, but who would not submit to the proposal. (See *Masses, Trunks, &c. de la Lig. des Arteries*, p. 18.)

Perhaps, in an operation of tying an artery, is the exclusion of the vein and nerves of so much consequence as it is in that of applying a ligature to the common carotid artery. As I frequently remark, this fact depends upon the importance of the organs to which the adjacent nerves are distributed, viz., the heart, lungs, and stomach. (See *Lectures Quinze*, &c., t. iv., p. 17.)

The right common carotid trunk is much shorter than the left: the former arising from the tracheocephalic trunk, the latter from the subclavian artery. Both trunks approximate the space between the scapulae and upper edge of the thyroid cartilage; and behind each of these are the jugular vein and vagus nerve, with the subclavian vessels, placed in front of the common carotid. In the lower part of the neck, the trunks are placed three inches higher up, the thyroid gland, and still higher up, the larynx and glottis. The external side of the common carotid is in contact with the internal jugular vein, which partly overlaps it; while between the two vessels, but rather behind them, and enclosed in the same common sheath with them, the pneumogastric nerve is visible. As the lower part of the neck, the carotid sheath has behind it the recurrent laryngeal nerve, and the inferior thyroid artery. The descending branch of the ninth nerve, commonly low above the thyroid gland, closely connected to it, and about the middle of the neck forms a plexus with several filaments from the second and third cervical nerves. At the upper part of the neck it lies rather towards the outer side of the sheath: at the lower, on the inner side of it. Mr. Harrison has often found it within the sheath, behind the jugular vein. The sympathetic and vagus nerves are situated between the sheath and the pneumogastric nerve. The common carotid artery is covered below by the skin, platysma, and dermal fascia, and also by the sternomastoid, sterno-hyoid, and sterno-thyroid muscles. Opposite the upper rim of the trachea it is crossed by the omohyoides, but from this point to its termination the vessel is covered only by the skin, platysma, and fascia. The omohyoides, as it proceeds from the shoulder, behind the sterno-mastoid muscle, divides the artery into an upper and lower portion, and the side of the neck into two triangular spaces. In the lower triangle, bounded by the trachea, clavicle, and omohyoides itself, the common carotid is concealed by the sternal origin of the mastoid muscle, and lies deeply; but in the upper triangle, bounded externally by the margin of the sterno-mastoid muscle, above by a transverse line, denoting the uppermost extent of this space below the scapulae, and below by the omohyoides, the vessel is much more superficial. Here, however, a plexus of veins often has its setting in view of the common sheath. (See *Vid. p. 18.*) *Masses, Trunks, &c. de la Lig. des Arteries*, No. 1, pl. iv.) A chain of abscesses starts in near the carotid sheath, principally on its external side, and are partly concealed by the sterno-mastoid muscle, and covered by the cervical fascia. In young subjects they are large and numerous; "they are frequently enlarged and indurated by chronic inflammation, the muscles and fascia press them

closely to the vessels; they become fixed, and have a pulsation communicated to them, so as to resemble aneurism." (*Masses, Trunks, &c. de la Lig. des Arteries*, p. 23.)

The operation of tying the common carotid is sometimes performed while the patient is in the sitting posture; but, on account of the chance of his becoming faint, I consider the recumbent position best, with the chest somewhat raised, the neck moderately extended, and the chin turned towards the opposite side. If the artery is to be tied below the omohyoides, the front edge of the sterno-mastoid muscle is to be first felt for, and an incision, three inches long, made in the direction of it, commencing opposite the cervical cartilage, and directed towards the sterno-clavicular articulation a little above which it is to terminate. On the other hand, when the artery is to be taken up above the omohyoides, the incision through the skin should begin higher up, and not be continued so low down. The second stroke of the knife divides the platysma myoides and dermal fascia, so as to bring into view the fibres of the sterno-mastoid muscle. Unless the latter muscle be made over the latter muscle, it is best to punch up a portion of the cervical fascia with the forceps, and cut it across, so as to make a small opening in it for the introduction of a director, on which it is to be slit up. (See *Quinze de Chirurgie*, p. 439, ed. 2.) An assistant now draws the lower margin of the wound, and the sterno-thyroid and sterno-hyoid muscles, towards the median line, while the surgeon himself divides the external margin of the wound, and the sterno-mastoid muscle external. For this purpose, bistouris are sometimes preferred, as not cancelling the parts so much as the finger.

The omohyoides is now seen running across the normal in the form of a red cord, and above and below it are the vein and artery, enclosed in their common sheath.

The sheath should be opened over the artery, and not over the vein, with the aid of a pair of forceps and a director. If the jugular vein swell up so much as to conceal the parts, pressure is to be made on it at the upper angle of the wound. (See *Vid. p. 18.*) *Masses, Trunks, &c. de la Lig. des Arteries*, No. 1, pl. iv., p. 241.) Then an eye-needle, or aneurism needle is to be conveyed between the vein and artery, and under the posterior surface of the latter, without meddling with the pneumogastric nerve, the great sympathetic, or any of their branches.

It seems to M. Volp, that if the surgeon were to cut at first to the inner side of the mastoid muscle, there would be some risk of meddlesome the sterno-hyoides for it not getting wrong. He thinks it better, therefore, to slit down upon the surface of the sterno-mastoid muscle, a few lines from its anterior margin. As the cords of the vein are very thin and easily torn, the knife is never to be applied near it.

If the sheath were not duly opened, the pneumogastric nerve, situated within its posterior layer, between the carotid and jugular vein, would certainly be tied, and the carotid nerve and descending may be in danger of being tied the same time.

The ligature of the common carotid above the omohyoides is rendered easier by the more superficial situation of the vessel, which is merely covered by the skin, platysma, and the cervical fascia. The incision is to commence a little below the angle of the jaw, and be continued down in the extent of about three inches in the upper triangle of the neck; that is, in the triangular

between the stylo-mastoid muscle and the larynx. The skin and platysma having been divided, the cervical fascia is to be pushed up with a pair of forceps, and an opening made in it by cutting it across. Then a director is to be introduced, and the operation finished according to the directions already given as applicable to that below the omohyoides.

In the operation of splitting a ligature to the subclavian artery, in the axilla of the axillary artery, the patient is to lie on his back, with his shoulders somewhat raised. The head and neck are to be turned towards the external side, while an assistant depresses the shoulder, and raises the arm from the side. The first incision is to be made transversely, an inch above the clavicle, at Volkmann's point, or near, or even upon, its very outer surface, prefer, from the outer edge of the stylo-mastoid muscle to the front edge of the trapezius. After the integuments have been cut, the platysma myoides is to be divided. The external jugular vein itself may generally be drawn aside with a blunt hook; but, if this cannot be readily done, a double ligature must be put under the vein, and tied, after which it is to be cut through in the interspace. Then the cervical fascia is well exposed, which is to be carefully opened by picking a piece of it up with the forceps, and making a small opening, which is to be enlarged with the end of a director. The edge of the scapular artery can then be immediately felt under and within the stylo-mastoid muscle. After having incised or separated the cellular tissue, adipose, plexus, &c., to the bottom of the wound, with a probe or a director, the finger is conveyed towards the insertion of the scalenus, where the intercostal of the first rib will be felt a little behind and on the outside of which the artery is always situated.

When once the artery is found, it is not necessary to bring it into view: for the nail, being applied to its posterior and external side, serves as a guide for the best exposure or dissection made, the point of which is to be passed from before backward, and a little from without inward, the surgeon keeping his finger over the artery, between it and the lowestmost nerve of the brachial plexus, so as to steady the vessel. (See Volkmann, *Not. Edin.*, &c., t. 1, p. 224.)

With reference to the ligature of the external iliac artery, I have but little to add to the account given of this vessel in the article *Arteries*. From the retro-iliac symphysis, where the common iliac artery bifurcates, down to the femoral arch, the external iliac artery describes a gentle curve, which is more marked in the female than the male subject, and the convexity of which is turned outward and backward. The artery descends along the inner margin of the psoas major, etc., to which it is connected by a thin membrane, derived from the gluteal fascia, stretched behind the artery. Although the probability from the iliac fascia is so thin that the artery and vein can be seen through it, yet it is sufficiently strong to prevent them from being displaced or separated. (See Harrison's *Surgical Anatomy of the Arteries*, vol. 2, p. 117.) The vein lies in the inner side of the artery, and at first rather behind it; but, near Poupart's ligament, it is on the same plane as the artery, resting upon the psoas, and upon a few fibres of the psoas and pectineus muscles. The anterior crural nerve runs in the iliac side of the artery, but on a plane posterior to it, and separated from it by the psoas, between which and

the iliacus internus the nerve covered by the iliac fascia is imbedded. "Two or three small branches from this nerve, and from the lumbar plexus, are connected to the artery, and descend along its external side." These branches are distributed to the spermatic cord and to the inguinal parts of the groin." (See Harrison, *Op. cit.*) The vessel, in its descent behind the psoas, crosses over the anterior surface of the external iliac artery, and supplies the vas deferens. As for the peritoneum, it is connected to the external iliac artery mostly by loose cellular tissue, and below runs the vessel, which is to be reflected over the posterior surface of the capsule of the bladder. The only branches it possesses, which the external iliac artery gives off are the circumflex iliac and the epigastric, which issue in opposite directions from the same point, a quarter or half an inch above or below this point. The abdominal aorta, which is on the right of the external iliac artery, being sometimes enlarged, forms a sigmoid flexure, which does not exist. On the right side, the cœcum, and on the left, the sigmoid flexure of the colon, are the only vessels exposed between the external iliac artery and the umbilicus of the abdomen. At MM. Brocq and Volkmann's notice, nothing is easier, in a thin person whose abdominal muscles are relaxed, than to make it feel a pulsation in this artery. "At Volkmann's observation in a young man, who met with an accidental wound of the artery above the union of the external, requiring the vessel to be tied without delay." (See Volkmann, *Not. Edin.*, &c., t. 1, p. 172.)

In Abernethy's method of tying the external iliac artery, an incision is made, about three inches and a half in length, in the direction of the artery, down to Poupart's ligament. The symphysis of the external oblique muscle being thus exposed, is to have an opening carefully made in it, and a director being now introduced, the aperture is enlarged in the direction, and to the same extent, as the vessel is the artery. "The internal oblique and transverse muscles, which are closely connected with each other, are to be carefully cut into the lower part, so as to allow a director, or the point of a hook, to be introduced below them, where they also are to be divided, the finger separating them from the fascia transversalis and peritoneum. The fascia transversalis, running from Poupart's ligament to the pubis, is perforated through with the nail, immediately over the pulsating artery, and the peritoneum is to be separated by the finger, and pushed upward and outward, so as to be detached, which, in this, as well as at all other operations on the iliac artery, is sometimes difficult, on account of the protrusion of the intestines, caused by the peritoneum, when the patient is not sufficiently aspirated. The artery is put at some depth, and covered by a thin cellular membrane, connecting it to the vein on its inside, and which must be torn through with the nail. The membrane itself is to be moved between the vein and the artery, and the point made to appear on the outside of the artery." (See *Fluency in Dis.*, &c., of the Arteries, p. 172.) This description, with the observations in the article *Arteries*, will suffice of nearly Abernethy's plan very intelligible.

To the account of the Artery Clavicular, we add of taking up the external iliac artery, given in that part of the Dictionary, *Arteries*, &c., &c.

In the article *Anastomosis*, a description is given of the operation of tying the *femoral artery* in the upper third of its course. If it were indispensable to apply a ligature to it in the groin, or just below the crural arch, the surgeon should remember that here the situation of the artery corresponds to the mid space between the superior epicondylar process of the humerus and the inferiority of the os pubis; though, in women, in whom the pelvis is wider, this artery is rather nearer the pubis. The vessel may also be readily felt as it is passing over the os pubis, being only covered by the integuments, superficial fascia, some lymphatic glands, and the fascia lata immediately below Poirson's ligament, the femoral vein, less on the pubic side of the artery. The anterior epical nerve branches half an inch away from the iliac side of the artery, imbricated between the claud and pectus muscles. (See *Harrison's Surg. Syst.*, 3rd. ed. ii. p. 136.) After the operation is completely done on one side of the artery, not interfering in any way with its distention, not striving as a direct guide for it, as it lies in the middle third of the thigh. In the operation, the limb should be extended and rotated inward, as directed under, beginning about an inch above Poirson's ligament, and extended downwards, in the direction of the artery, in the distance of two-thirds before this ligament. The layers of the superficial fascia are then to be divided to the same extent, making lymphatic glands in the way, pushed to one side, or, if enlarged and diseased, removed. The fascia lata is next to be divided, and the sheath of the femoral vessels pushed up with a pair of forceps, and cautiously opened. Lastly, the anastomosis, or syringe used for the conveyance of the ligature under the artery, is to be introduced on the pubic side of this vessel, between it and the vein, so as to have the latter completely cut. As, in some individuals, the origin of the profunda is unusually high up, and of nearly the same size as the femoral, one of them might be mistaken for the other. The profunda, however, is the more external of the two. The effect of pressure is such in checking the hemorrhage, in the pulsation of an anastomosis, will also be a guide to the operator. (See *Harrison, Op.*, vol. iii. p. 160.) Sometimes a double femoral artery has been met with.

The direction given by N. Meisner, to place the ligature as closely as possible above the origin of the profunda (*Mon. & Med. Op.*, 7. 185), if adopted, would be very likely to be followed by profuse hemorrhage, for vessels elsewhere exposed. (See *Harrison, Op.*)

The operation of tying the *femoral artery* in the middle third of its thigh has never been fully described in the article *Anastomosis*, I attach the following particulars. This artery, in its course from the epical arch to the lower third of the thigh, runs in the direction of a line, which, drawn from the centre of Poirson's ligament, descends obliquely inward toward the line to the middle of the popliteal space. This direction is nearly correct; but, as Dr. Quain observes, as this line runs along the inner border of the thigh, its course is more oblique than that of the vessel, which is placed much nearer the axis of the femur. (See *Ann. of Anat.*, vol. ii. p. 2.) In the middle third of the thigh the femoral artery is more deeply placed than in the upper, because, in addition to the integuments, superficial fascia, and fascia lata, it has the sartorius lying over it, beneath which there is also another fascia, ex-

posed over it, from the adductor muscle to the vastus internus. This fascia, though thin, is very dense where the artery approaches the opening in the adductor magnus. In the groin the femoral vein lies close to the inner side of the artery, but as it descends it gets more under the latter vessel, behind the popliteal space it is situated quite to the outer side of it.

An incision three inches in length is to be made along the inner edge of the sartorius, which is the common rule, and perhaps better than Liston's modification, which consists in making an incision of this length in the mid space between the gracilis and sartorius; for, by exposing the fibres of the latter muscle, there is more efficient manual instruction to the surgeon. For he then knows immediately where he is, and what ought to be done. The integuments and superficial fascia having been divided, and the fascia lata to the same extent, the inner edge of the sartorius is exposed. This is to be gently raised and drawn outward. The fascia, extending from the vastus internus to the adductor, and covering the artery, is brought into view, and, with the aid of a pair of forceps and a scissor, it is to be externally opened, by which means the sheath of the femoral vessels will be exposed from the great epical arch down within the sheath, on the internal and external side of the artery, and the vein is not to be incised in the ligature. Lastly, the anastomosis needle is to be conveyed under the artery, between it and the vein. In making the incision through the integuments, the great epical vein should be avoided by not directing the knife too obliquely downward and backward.

In addition to what has been stated in the article *Anastomosis* respecting the *ligature of the brachial artery*, I may observe, that the course of this vessel corresponds to an oblique line drawn from the acromion to the middle of the bend of the elbow. The median nerve, which runs along its radial margin, soon gets in front of it, and, crossing it very obliquely, passes quite to its inner side below. Two satellite veins usually accompany the artery, and even sometimes cover it, and thus separate it from the median nerve. The ulnar and internal cutaneous nerves, which lie near it above, separate further and further from it as they descend, in order to reach the inner part of the forearm. The artery, lying at first near the humerus, between the coraco-brachial and the tendon of the latissimus dorsi, afterward passes over the insertion of the coracobrachialis, and gets upon the brachialis anticus, a little behind the inner margin of the biceps, which last imposes it altogether to its termination. In the upper third of the hand the brachial artery is less covered by the biceps; and hence, in the operation of taking it up, this position is advantageous. (See *Mon. & Med. Op.*, p. 186.) In this respect the brachial is almost analogous to it, and tends of a supracarpal to behind the artery, the two accompanying veins and the median nerve, all which form, as a vein, one common fasciculus.

The whole is covered by the common integuments, and, in the lower third of the arm, by the biceps of the brachial vein. The anastomosis of the brachial artery are very frequent. Velpeau and most other anastomosis have seen it divide near the axilla, and at nearly every other point between this and the elbow. In the subject Velpeau found its bifurcation take place two inches above the insertion of the biceps, to form the ulnar

and posterior interosseous. In another, the latter was completely independent of both the ulnar and the radial. Sometimes the two trunks produced by the bifurcation lay down to the forearm parallel to one another; in other instances they cross once, or several times, and it is not uncommon to find one passing the facter as so to get immediately under the skin, while the other, which then gives off the radial and the interosseous, remains its ordinary situation. (See *Volsen's New Atlas de Méd. Op.*, t. i., p. 210.)

In the operation of placing it together on the brachial artery at the bend of the elbow, the surgeon should remember that the course of the vessel here corresponds to a line drawn obliquely inward and upward, from the pituita of the front of the elbow to the inner border of the biceps. Its course is also denoted by the median basilic vein, which passes under the skin almost in the same line as the artery. An incision, between two and three inches in length, is to be made through the skin on the inner side of this vein, which is to be carefully drawn out of the way. Then, with the aid of a director, the fascia, and the flexor profundus, given off from the tendon of the biceps, are to be divided, which having been accomplished, the artery will present itself, bounded on the right and left by its two veins, scabrous, the median nerve lying three or four lines from its upper border. To facilitate the passage of the quadrum needle or director under the artery, the elbow is to be a little bent, and the instrument passed from within outward under the vessel. (See *Mace's Op. cit.*, p. 188.) If the operation were performed somewhat higher, the surgeon must remember that two or three inches above the trochlea of the humerus the median nerve would begin to be in front of the artery.

In the upper part of the arm, the brachial artery lies at the inner border of the coraco-brachialis, and has the median nerve at first external to it, and then in front of it. Below the insertion of the coraco-brachialis, it is situated at the upper edge of the biceps. Four circumstances are enumerated as guides for the external ligament: 1. The inner edge of the coraco-brachialis above, and that of the biceps below. 2. A line drawn from the middle of the axilla to the middle of the bend of the elbow. 3. Placing the finger on the median nerve, and feeling on its upper side. (Lefevre.) 4. The pulsations of the artery. The knife is carried in the direction of the artery from above downwards in the right arm, and from below upward in the left, and an incision made in the integument about three inches long.

With the forefinger the surgeon next endeavours to feel the median nerve, which presents itself as a round very hard cord, and to distinguish the artery by its pulsations. He then divides, with the aid of a director, one after the other, the fascia, and the sheath given off by it to the median nerve; and breaking, with the end of a probe or director, the fibro-cellular coating of the vessels, separates the artery from the veins, and puts a ligature upon it. Except when anomalies occur, the operation is simple. M. Volsen has only twice seen the median nerve under the artery. In all ordinary cases it is the first cord met with behind the inner margin of the biceps. (See *Volsen's New Atlas de Méd. Op.*, t. i., p. 211.)

No serious or complicated accidents have made the slightest mistake of tying the median nerve

for the brachial artery; I adhere to the practice never to tighten the ligature until he has tried the effect of pressure on what he supposes to be the artery.

In order not to mistake the ulnar for the median nerve, and to be led off even for the artery where it will not pass, it is an excellent rule to proceed in the operation from the exterior to the posterior part of the arm. (See *Mace's Op. cit.*, p. 187.)

Ligature of the Radial Artery at the Elbow.—It is the thumb, be forcibly extended, the motion of the distal phalanx and long extensor will be made very prominent. In the depression between them, the pulsations of the radial artery can be felt. The thumb being drawn away from the forefinger, an incision an inch and a half in length is to be made in the direction of the flexor tendons, first through the skin, and then through the fascia. The artery is then to be separated from some veins and nerves, ligatured with a probe or director. (See *Mace's Op. cit.*, p. 183.)

After the radial artery leaves the forearm of the wrist, it may be taken up by making an incision on the outside for the insertion of the extensor pollicis, intermedia pollicis and the tendon of the extensor carpi radialis pollicis. Between these tendons, the artery lies very deep, and can it is the extreme branch of the ulnar spiral nerve. We find the artery going close to the scaph, between the os scaphoides and trapezium. (See *C. Bell's Op. Surgery*, vol. ii., p. 272.)

Ligature of the Radial Artery in the Lower Part of the Forearm.—Here the artery can readily be felt, being easily covered by the fascia and the skin. On each side of it two veins, but the radial nerve or considerably to the outer side of it, having passed under the oblique transverse ligament a little below the middle of the forearm. An incision two inches and a half long is to be made a little way from the radial margin of the flexor carpi radialis, between the skin and the superficial fascia. The fascia is to be opened, and the artery exposed from within outward, or from without inward, as the surgeon may choose, as it is a matter of indifference; the nerve being out of danger.

Ligature of the Radial Artery in the Upper Third of the Forearm.—Here the artery runs in the space which separates the supinator radialis from the pronator teres and palmaris longus, externally to the external border of the flexor carpi radialis, and of course to the humerus and the vein. It is always accompanied by two veins, and its radial nerve is its outside. It is completely surrounded by a sheath drawn from the middle of the bend of the elbow to the distal end of the styloid process of the radius and the tendon of the palmaris longus.

In the direction of this line, M. Roux makes an incision about two inches with a half an inch, penetrating a little below the skin. If the median vein is met with, it is pushed aside. The fascia is then cut up with a director, and the artery of the flexor supinator drawn outward, without dividing it. The artery having been seen in view, the stemomuscular is cut, and it is passed under it then without entering on account of the nerve. (See *Mace's Atlas de Méd. Op.*, p. 184.)

Ligature of the Ulnar Artery in the Wrist.—Here the artery passes on the radial side of the posterior bone, with the ulnar nerve as an outer sheath, and a vein on each side of it. In this place

an incision two inches long to be made through the skin, cellular tissue, and palmar aponeurosis, one after the other. The artery having been thus exposed, an exploring needle is to be passed under it from without towards.

Below the surface of the forearm the ulnar artery is superficial, and may easily be taken up by making an incision upon the radial side of the flexor carpi ulnaris, between the tendon of which muscle and that of the flexor profundus dissection the vessel is situated. The artery, however, will not be reached until a thin aponeurosis under the fascia of the forearm has been divided. The nerve is either more under the tendon of the flexor carpi ulnaris than the artery. When the ulnar artery comes from the brachial above the elbow, it passes, and runs above the fascia, and is easily taken up in any part of its course.

For bringing into view the ulnar artery at the upper end of the forearm, the situation and breadth of the flexor carpi ulnaris muscle must first be ascertained. An incision is then to be made from above downwards, beginning five inches below the inner condyle of the humerus, and following the course of the inner margin of the above muscle to the extent of two inches and a half. The fascia is then to be divided, and the flexor carpi ulnaris drawn a little away from the flexor cubiti. In this opening, rather within the margin of the latter muscle, the ulnar artery will be hit with the finger, extending the course over the flexor profundus. The ulnar nerve is situated on the ulnar side of the artery. Mr. Guthrie's opinions respecting the propriety of dividing the muscles which covered the upper third of the ulnar artery have been noticed in the beginning of the preceding article.

Course of the Anterior Tibial Artery on the Foot.—The anterior tibial artery becomes very superficial about six inches above the instep, from which point it descends between the tendon of the tibialis anterior and that of the tibiocrural of the foot. It passes with these tendons under the singular ligament, and rather nearer to the internal malleolus than the external; thence inclining upwards, it penetrates between the first and second metatarsal bones to the side of the foot, where it anastomoses with the external plantar artery. The first branch of the deep dorsal nerve of the foot is at its entrance, its corresponding vein at its outer side. It is covered, 1st, by a thin fibro-cellular expansion, separating it from the adjoining tendons. 2dly, by adipose cellular tissue. 3dly, by the fascia of the foot. 4thly, by the median intermetatarsal. On the instep, the first branch of the posterior tarsal artery divides into two upon the outer side of the artery: that of the extensor of the great toe goes to the edge of the shoe.

An incision two inches and a half long is made in the skin, in the direction of an oblique line from the middle of the instep to the first intermetatarsal space. The skin, adipose substance, and fascia are to be divided, the fibro-cellular expansion between the tendons of the first two toes opened, and the artery laid, after being separated by means of a director from the accompanying veins and nerves. (Vide supra.)

Course of the Anterior Tibial Artery in the Leg.—The two upper thirds of this artery lie close to the interosseous ligament, but lower down the external edges towards the outer side of the spine of the fibula, respectively, the higher is on the more deeply it is situated. The two veins accompanying it fluctuate across it by

several small branches. The anterior tibial artery crosses over it obliquely upwards and downwards, though sometimes it continues on its outer side down to the instep. The artery, veins, and nerve are included in cellular tissue, which does not, however, form a true sheath for them. Above, the artery lies between the tibialis anterior and the interosseous cutaneous, in the middle of the leg, between the tibia and fibula and the extensor of the great toe, and still lower down, between the extensor of the great toe and the extensor communis.

In order to lay bare the anterior tibial artery a little above the middle of the leg, the finger is to be passed along the outer side of the spine of the tibia, and the breadth of the tibia anterior muscle is to be ascertained. Making the outer margin of this muscle an incision is to be made, through the interosseous and fascia, two inches and a half in length. The artery is then to be introduced between the outer margin of the tibia anterior muscle and the extensive ledge of the great toe. In this space, at the depth of about an inch, the anterior tibial artery is situated. (See Hall's *Less. Anat. Yench.* tab. 4; also *J. P. Moore, de la Lig. de l'Art. Ant.* p. 12.)

Course of the Anterior Tibial Artery in the Lower Tibia.—The skin, the interosseous lig., the cellular tissue, and the fascia, are to be divided in succession to the extent of about three inches, and in the direction of a line drawn from the heel point between the head of the tibia and spine of the fibula to the instep. Then, with a director or the forefinger, the tendon of the extensor muscle of the great toe is to be separated from that of the tibia anterior, passing it subwound from the extensor communis if the operation is at the upper part of the lower third of the leg, but instead if the operation be done quite at the inferior extremity of the leg. Nothing then remains to be done but to separate the artery from its accompanying veins and from the anterior tibial nerve, which in this part of the limb is at its inner side, having crossed it from the outer to its descent. (See Moore, p. 12, fig. 1; *Vid. supra, Nerv. Edm.* 4c, 6, 7.)

Course of the Anterior Tibial Artery in the Middle or Two Upper Thirds.—Laffaye makes an incision extending obliquely from below upwards, from the spine of the tibia towards the fibula. Having cut impudently through the fascia, the interspace between the tibia and fibula and the cutaneous is brought for.

In the ordinary method of dissection made in the first of this artery, as determined by the line above specified, about an inch on the outside of the spine of the tibia. The skin and fascia are divided to the extent of three inches. The muscular interspace, at the bottom of which the artery will be found close to the interosseous ligament, is denoted by a yellowish line. In order to observe the ligament round the artery, Velpeau passes a director under it very obliquely, from below forward, and from the fibula towards the tibia.

Course of the Posterior Tibial Artery.—From downward, a little before the popliteal muscle, in its division into the external and internal plantar arteries, the posterior tibial artery follows very precisely the direction of a line with a slight curvature, from the middle of the upper part of the calf to a point half an inch behind the internal malleolus. Two veins usually accompanying it anastomose forming by their structure a complete network round it. In the upper part

of the leg the posterior tibial artery lies to the inner or third side of the artery, but soon passes over it to the outer or fourth side. In the two upper thirds of the leg the posterior tibial artery is deep seated, lying in the upper third upon the tibia, posterior, in the middle third upon the flexor digitorum communis, while below down it is separated from the tibia only by latissimus pedis muscle. From the gastrocnemius and soleus it is united by the deep medial fascia, which muscles lie over its two upper thirds. In the lower third no muscles cover it.

In the arch of the os calcis the posterior tibial artery is in contact with the fibrous sheath of the flexor communis digitorum, about half an inch from the posterior border of the tibia malleolus. Here the artery is lodged in the sigmoid aneurysm. "The artery is encased in a pellicular and adipose tissue." The fibrous sheath of the tarsus, a fibrous layer continuous with the tarsus of the leg, after crossing the artery, becomes blended with the dense cellular tissue interspersed between the vessel and the skin. (See Velpeau.) Between the tarsal malleolus and the lower part of the calf, the posterior tibial artery is somewhat further from the lateral edge of the tibia, and the nerve is rather on its outer side than behind it. The degenerated fascia, which is here very thin, keeps the artery bowed down upon the tarsal malleolus, flexor digitorum communis profundus, and flexor digitorum profundus pollicis. External to this fascia is the course that the artery takes of the vessels of Achilles, and then the columnar form of the leg directly under the skin.

In the calf the posterior tibial artery is very deeply seated, almost on the same plane as the posterior surface of the tibia, and much nearer to medial than to lateral edge than its internal. It is covered by a strong fascia that lies over the flexor muscles, and then by the fibrous portion of the system; the internal head of this gastrocnemius; the fascia of the leg; the adipose cellular tissue, in which are found the great superficial vein and the internal saphenous nerve; and lastly, the skin. (See Velpeau.)

Course of the Posterior Tibial Artery.—The leg is to be bent and laid upon the outside.

Behind the malleolus internus.—An incision, slightly curved, with its convexity forward, is to commence at the malleolus, and to terminate an inch below the posterior edge of the malleolus internus, and to be at least three lines behind it. It will, therefore, be between the malleolus internus and the tendon of Achilles. If the operation is to be performed in the hollow of the os calcis, it is necessary, as M. Velpeau directs, to divide the tibial capsule, layer by layer, and to introduce a director under the fascia previously to its division, lest the artery, which is sometimes very superficial, be wounded. If the incision were made too near the malleolus, the firm support of the arch would be wanted. If too far behind, the artery would be more difficult to find. (See Velpeau, *New Evid. de Med. Quæ.*, t. 14. In fact, when the lower end of the tibia, the tendons of the flexor digitorum and of the flexor digitorum communis pass, in a kind of purse. Along with these two tendons, but somewhat nearer to the os calcis, the posterior tibial artery descends to the sole of the foot.

The depth of the posterior tibial artery at the two upper thirds of the leg makes it difficult to take it up in these situations. When necessary, however, it may be exposed, and tied above

and below the second is it, by proceeding as follows: An incision four inches in length is made along the inner side of the tibia; the cellular tissue is detached from the bone to the same extent, and reflected. The internal saphenous vein is to be avoided. Under the flexor digitorum communis, which is passing the muscles of the calf into superficial and deep-seated. When this fascia has been divided, the posterior tibial artery may be seen as well, deeply seated, resting on the tibia, posterior and lower middle of the vein. (See *Atlas*, *Ann. d'Anat.*, t. 1, pl. 5.; *Mémoires de la Soc. de Médecine*, 1822, pl. 13-4.)

The method of trying to tie up the posterior tibial artery, by making the incision at the lower end near the edge of the tibia, is thus proved by Mr. Guthrie on account of its situation. "The operator says he has cut his four inches, has turned up the edge of the gastrocnemius, and has performed his dissection under the head of the patient, which he has also about three from the bone. The artery is small as with arteries, turned down by a strong fascia, which 'seems to be an incalculable, over, or by the side of the artery, it will not do so separate it from the bone, and then to push it over, it comes below.' This supposes the fascia to be divided in the lower part, Mr. Guthrie doubts the separation of the two veins from the artery, and the passage of the gastrocnemius under the artery from within outward, so as to avoid the artery, without incalculable. 'If a tri-vascular vessel separates the most painful, difficult, bloody, tedious, and dangerous operations at home, the surgeon would be, hardly because it was not total to make a complete incision in the muscles of the calf of the leg, with incision, which, if made by accident, would be pronounced to be an absolute and very little danger, and not likely to lead to any dangerous detourments.' (See *Theses de la Faculté de Médecine*, p. 229.)

Instead of this method Mr. Guthrie advocates the following: An incision is to be made six or seven inches in length, through the gastrocnemius and tendons of the calf down to the bone. If the case is a gunshot wound, the extent of the incision is to be over a line with the skin edges, or if they are disjoint in each other, between them. The smoothings of the fascia piece of skin and the thick cellular membrane, turning the divided muscles to it, allows all parts of the leg to remain to be easily separated, and the flesh to be exposed to the vessel, artery, and vein. The tourniquet is now to be removed, and the bleeding stopped. When the artery is found, the knife may be applied perpendicularly to the bone, and the artery laid bare to the os calcis, and taken in external. (P. 235.) Perhaps the form of the incision is better described, in which part or that is equally necessary. Five or six inches and a half of the calf, or more, where the bone of the calf is very thick, will be enough to make the wound long.

Course of the Posterior Artery.—How to find it. Mr. Guthrie's description of the incision should also be made through the tendons of the calf to the bone, the cellular tissue of the leg, and the deep fascia under which has been found the artery will be found covered by the body of the flexor digitorum communis and the flexor digitorum profundus, and a half from the bone of the calf. These three having been exposed, the artery will be found close to the side of the bone. Above the point specified, the artery has very

the *tubalis posterior*, under the deep fascia interposed between it and the muscles of the calf. No nerve accompanies it.

Ligation of the Axillary Artery.—In preparing as this vessel approaches the lower of the axilla, it gives access to the vein, and becomes surrounded by those nervous fasciculi, by means of which one portion of the brachial plexus communicates with another. Before, to cut down to the artery in this place is the living body, and to tie separately, is acknowledged to be an arduous task. The difficulty is further increased by the distance of the vessel from the surface. Hence M. Manec decries any attempt being ever made to apply a ligature to the artery between the pectoralis minor and the lower border of the subscapularis. Independently, says he, of the difficulties of the operation, this part of the axillary artery would be unfavourable to its success, on account of the several branches which are given off from it, two of which the ligature must be placed.

Directly the axillary artery has arrived opposite the lower border of the great pectoral muscle, the difficulty ceases. Here the brachial plexus no longer exists; each of the different nerves arising from it has taken the course to its particular destination, and the artery is only covered by the integuments and fascia. Behind, it rests upon the tendon of the outer major and latissimus dorsi, in front, it corresponds to the coraco-brachialis, from which it is separated by the median nerve. At its inner side are the external circumflex nerve and the axillary vein, which sometimes consists of two or three branches, and renders the dissection of the artery more tedious. Further backward than the axillary vein are the ulnar and musculo-spiral nerves. The relation of these last nerves to the artery is of great importance to recollect, in order that neither of them may be mistaken for the median nerve.

In the operation of taking up the extremity of the axillary artery, the patient should be placed upon his back, and the arm raised from the side. An incision two inches and a half in length is to be made six or eight lines lateral to the anterior margin of the axilla, through the skin and subcutaneous cellular tissue. A piece of the linen is then to be filled up with the thumb, and an opening made in it by rolling transversely, close to the end of the forefinger; then a director is to be passed into the opening, and the fascia slit up to the extent of the external wound. If the fascia be tough and dense, so as not to afford convenient entry, Manec recommends the incision in it to be converted into a crucial one. These things having been accomplished, the further use of the knife is not necessary. The inferior edge of the wound being now filled up, the coraco-brachialis will be seen, and the median nerve at its inner side. This nerve being detached, the artery will be found behind it.

M. Manec offers valuable cautions with reference to the manner of avoiding the serious mistake of supposing the ulnar or musculo-spiral nerve to be the median. To escape this blunder, he very properly insists upon the prudence of proceeding backward from the coraco-brachialis, for in doing so the first nerve arrived at is the median. (See Manec, *Ymag. de la Lig. des Artères*, fol. Paris, 1822. Expt. of pl. 5.) In the case of a wound, however, the surgeon has not exactly the choice of the place for the application of the ligature to the axillary artery. Here he

must obey the rule of applying it to the wounded part of the artery, and putting one ligature above and another below the bleeding orifice; or, if the artery be completely severed, both its extremities will require to be tied.—(C.)

ARTERIOTOMY (from *Arteria*, an artery, and *tomo*, to cut). The operation of opening an artery, and taking blood away from the system in this manner for the purpose of preventing, alleviating, or curing disease. The only arteries of any use from which blood is ever taken in practice are the trunk and branches of the temporal artery, which lie in such a situation that, after the due quantity of blood has been taken away, the bleeding can be easily stopped by compressing the wounded part of the vessel against the neighbouring portions of the cranium. A narrow, sharp-pointed lancet, or a lancet, a basin for the reception of the blood, a compress, and a roller, are the only things required. In general, it is best to open the trunk of the temporal artery; but sometimes its frontal or occipital branch will yield blood enough. But, in many instances, it is better first to make a cut in the skin, and then puncture the vessel. In all cases the surgeon should recollect, 1st. That the temporal artery and its branches are covered by the skin, adipose cellular tissue, and a thin aponeurosis. 2d. That the trunk of the artery divides in the temple, about fifteen lines above the zygoma, and is situated about four lines in front of the trachea accliformis. 3d. That the frontal branch runs forward from its origin, and its occipital branch in the opposite direction. A good place for the puncture is about four lines above the zygoma. In taking away blood from the temporal artery or out of its branches, the surgeon should never forget the fact that the loss of arterial blood produces a more debilitating effect than that of venous; but, in many instances, the requisite quantity of blood cannot be drawn by this operation, as every surgeon of experience must have observed. In order to prevent the blood from trickling down over the bedding to clothes when it does not waste in a jet, the French make a little pillow with a piece of card for conveying it into the basin. After the proper quantity of blood has been taken away, a graduated compress and the nodose bandage are applied. The latter consists of a simple band, four yards long and two fingers' breadth wide, rolled up into two heads of unequal size. The smaller portion being applied over the graduated compresses that cover the wounded artery, the surgeon conducts the two heads, before and behind, to the opposite temple, where he crosses them in order to return to the point of departure. He now gives them a turn or two, which enables him to carry one over the strand of the band, and the other underneath the chin to the second side, where they meet and cross, as in the first incision. Thence they are conducted in the same course to the point of departure, and a second twist being effected, they are conducted for the third time to the opposite temple, and for the third time returned also horizontally and knotted: being conducted finally, one over the vertex and the other underneath the chin, the bandage is terminated by a few convolutions of the long end. (See *Cutler's Surgeon's Practical Guide in Disease*, and in *de Méthode d'Application de Bandages*, p. 46, Paris, 1826.) A graduated compress, and a few turns of a roller, rolled the forehead, temple, and occiput, are generally preferable to the foregoing bandage, the part of which extending under the

this is often very insupportable to the patient. In a few cases, notwithstanding pressure, the blood issues forth from time to time; and when this happens, it is best to cut the vessel completely across, which will enable its ends to retract and contract, and thus promote the process of union in closing them. In three or four days the wound is generally healed, but occasionally an abscess follows; an interesting memoir on which subject has been published by M. Desmoulins. (See *Mém. de la Soc. Méd. et de Statist.*, t. ix., p. 277.) In one instance, Cavallini effected a cure by dividing the vessel and coagulation. (See *Codex de Cas. Civ.*, t. ii., Firenze, 1792.) Sir Benjamin Brodie informed me of a case which he treated successfully in a similar manner. In the course of the present year, 1838, a woman was under my care at the North London Hospital for a temporal aneurism, which followed rapping on the temple. As the blood found its way freely into the tumor after one branch had been tied, I divided another, and applied a compress; the plan was then effectual. Sir Astley Cooper informed me of a temporal aneurism which was produced by a person falling with his temple against the corner of a table.

M. Blandin had a patient who, in consequence of arteritis, suffered acute pains, which extended to the top of the head, in the track of the superficial temporal nerve; this consequence, which is uncommon, may be relieved by lengthening the puncture or incision at each of its angles, or even cutting out a portion of the nerve. (See *Bist. de Méd. et de Chir. Pratique*, t. xiv., p. 472.)—G.]

[ARTERITIS. *Inflammation of an Artery.*—As the coats of arteries possess vessels and nerves of their own, and have an organization more or less similar to that of all the living parts of the body, they must be liable to inflammation, suppuration, ulceration, and gangrene, as well as other morbid changes, especially a deposit of calcareous or albuminous matter between the inner and middle coats. Arteritis, as contrasted with phlebitis or inflammation of veins, is much less perfectly understood, so far as the symptoms and diagnosis are concerned. It is very certain, however, that the arteries are not so liable as the veins, and, consequently, that arteritis is less frequent than phlebitis. Pathologists divide it into acute and chronic. The anatomical changes of the acute are, redness of the internal membrane of the artery affected, an effusion of plastic fibrine on its inner surface, thickening of its substance, and sometimes ulceration. When inflammation runs from a wound, or some other point of irritation, along the internal coat of an artery far towards the heart, it is like phlebitis; a formidable disease, rapidly producing great invasive fever, an extremely quick pulse, complete collapse, low delirium, and generally death. Arteritis, by completely obstructing a main artery and its principal branches, is sometimes a cause of mortification. The treatment of acute arteritis consists in bleeding, purgatives, diaphoretics, low diet, cooling diluent drinks, and perfect tranquillity. Digitalis, tartaric acid, and super-acetate of lead, are also prescribed on the principle of calmer the circulation; but, as Dr. Hope observes, they must be used with discretion. (See *Cyclop. of Pract. Med.*, part p., p. 119.) After the first violence of the inflammation has been checked, narcotic is sometimes given, so as to excite gentle but quick salivation.

Chronic arteritis is more common than acute. The internal membrane becomes thickened, softened, and of a deep, dirty red color. These appearances (says Dr. Hope) are not uniformly diffused, but more marked in the vicinity of calcareous and other degenerations. Hence some have supposed that these degenerations were the cause of the inflammation. There can be little doubt that they tend, in many instances, to keep it up; but it is highly probable that the degenerations themselves were originally caused by increased vascular action of a chronic nature. (See *of Pract. Med.*, pt. ii., p. 145.) The treatment of arteritis chronica is now generally believed to have its origin in chronic arteritis.—G.]

[ASPHYXIA (from α , privative of, and $\psi\upsilon\chi\eta$, the pulse). Denotation of the action of the lungs from the interruption of respiration, or, rather, of the effect produced by that function in the blood.

Asphyxia may also be defined to be a suspension of the phenomena of respiration, occurring primarily, and followed by that of all the vital functions, and frequently by death. The general causes of asphyxia may be arranged under three principal heads. 1. Asphyxia from deficiency of air. 2. From the air being unfit for respiration, yet not producing any deleterious effect on the economy. 3. From the respiration of some air which is deleterious. As M. Broussais rightly observes, however, the suspension of respiration, or the mode of death in the last case, is very different from what is exemplified in the first two, because it is, in fact, a kind of poisoning brought about by the action of a deleterious principle either on the nervous system or the blood, and the individual may perish though he is actually respiring air. (See *Théorie de Méd. et de Chir. Prat.*, art. Asphyxie.)

Cases of asphyxia admit of a classification, first, into those in which there is primarily a stoppage of the mechanical phenomena of respiration, and, secondly, into others in which the chemical phenomena are primarily interrupted. An example of the first mode of asphyxia, it will suffice to mention those in which the nostrils of respiration are cut off. 1. This happens when a heavy mass of earth or other solid matter falls upon a man, and induces great pressure on the chest or abdomen. 2. When the nervous influence does not extend to these vessels, as when the vertebra spinalis is injured high up, or the phrenic nerves have been paralyzed by the effect of lightning. 3. When the voice muscles are in a state of inaction from the influence of intense cold. Asphyxia, from the passive expiration of the lungs not taking place, may be exemplified in cases where the abdominal viscera are forced through an accidental or natural opening of the diaphragm into the chest, or when the lungs are compressed by fluid in the cavity of the pleura, and various other cases.

Asphyxia depending upon the primary suspension of the chemical phenomena of respiration is of two kinds. In one, it arises from some mechanical impediment to the entrance of air into the lungs, as in cases of foreign bodies external the trachea, intertension, strangling, &c.; in the other, it depends upon a deficiency of air fit for the purposes of respiration.

Asphyxia may be the original affection, or it may be only the termination of another disease. Thus a person is attacked by convulsions, and dies of asphyxia, caused by accumulation of the lungs; or he is seized with pleurisy, and is ultimately destroyed by an effusion of serum fluid in

the chest. (See *M. François in Dict. de Méd. et de Chir. Pratique*, Asphyxie.)

As the salutary effect of respiration depends upon the air which is inspired containing a due proportion of free oxygen, the deficiency or absence of this element must necessarily produce asphyxia. On this principle, azote, hydrogen, carbonic acid gas, and air too highly impregnated with carbonic acid, will cause asphyxia. Carbonic and some other gases not fatally also, on the principle of being positively deleterious to life when introduced into the vessels. One reason in which asphyxia may be occasioned is by constriction of the lungs of warm-blooded animals not having an organization qualifying them to derive from the oxygen contained in water the salutary influence on the blood which they collect from the respiration of atmospheric air.

Asphyxia may likewise arise from various circumstances preventing the entrance of air into the lungs, as the lodgment of a foreign body in the larynx, trachea, or oesophagus; a swelling of the mediæstinal of the lungs; a constriction of the organs and the trachea with fibrine, as in croup; tumors formed near, or pressing upon some part of the respiratory tube, and pressure upon the same organ from any other cause, as is exemplified in strangulation. It has been explained that some causes of asphyxia operate by destroying the mechanism of respiration, that is, by paralyzing the muscles concerned in this function, namely, the diaphragm. It will, at the same time, paralyze the other principal muscles concerned in producing the respiratory changes in the dimensions of the chest; and, consequently, a fatal asphyxia must take place. This was well illustrated in a case lately brought into the North London Hospital. The child of a youth, aged fifteen, was caught by the wheel of some machinery, which drove his neck with great force against the works, and, at the same time, curved violent strangulation. In about one minute the hæmorrhoidal was cut through and the constriction removed; he was brought to the hospital with his respiration stopped, and asphyxia from this cause. Attempts were made to restore respiration and the action of the heart, first, by blowing air into the lungs through the nostrils. Whenever this was done, the action of the heart returned, the pulse rose, and the livor of the lips and countenance disappeared, but as soon as the inflation of the lungs was discontinued, then the pulse sunk so as to become scarcely perceptible, and the skin assumed the purple colour again. Finding that this happened repeatedly, a suspicion was entertained that the cervical vertebra had sustained injury, but, in order that the inflation of the lungs might have every chance of doing good, in the event of other injury not existing, I performed tracheotomy, and air was introduced into the lungs with a pair of bellows and a tube. All this, however, was in vain; and galvanism was equally unsuccessful. The boy was kept in a state exhibiting signs of life for about six hours from the period of the accident; but his temperature continuing to get lower and lower, he at length sunk. In the post mortem examination, a fracture of the arch of the third cervical vertebra, a laceration of the front ligament of the spine, an effusion of blood on the medulla, and also another effusion behind it, - placing, were detected.

Formerly, the cessation of the action of the heart in hanging or drowning was referred to a mechanical impediment to the transmission of blood through the lungs to the left cavities of the heart. But the experiments of Goodwyn and others prove that no such mechanical obstruction exists, and that, even after the highest expansion, the air remaining in the air-vessels of the lungs distends them sufficiently to permit the blood to circulate freely through them. The real operative cause was of the interruption of those distal changes which atmospheric air produces on the blood while circulating in the pulmonary vessels, and which convert it from venous to arterial blood. In fact, the blood, which in asphyxia thus acquires its venous character, does for a time pass through the pulmonary circulation, and is conveyed into the left ventricle, which propels it into the aortic system of arteries. But this blood, which is thus substituted for arterial, has deleterious properties, depriving the organs to which it is sent of the power of performing their respective functions. Secondly, irritability, together with all the physical and vital actions depending upon them, are suspended. (See *Rogee in Cyclop. of Pract. Med.*, art. Asphyxia.) From the investigations of Bidart, it appears that the primary effect of the circulation of venous, or what he calls black blood, is on the brain, and that this effect extends through the intervention of the brain, to the whole nervous system. Loss of sensibility therefore precedes the suspension of the action of the heart, and takes place as soon as the venous blood sent into the arteries reaches the brain. (See *Bichat, Recherches sur le Viv et le Mort*.)

The face of a person who has been drowned is a general pale, though slightly livid. A frothy liquid, and some water, are found in the trachea, bronchia, and air-cells of the lungs; the latter organs are of a violet colour, but contain less blood than where asphyxia has been occasioned by carbonic acid gas; the right auricle and ventricle are filled with black blood, as the stomach there is generally more or less water, which has been swallowed; the surface of the brain is of a darker appearance than usual, but its vessels not particularly turgid; and the air remaining in the lungs contains little oxygen. (See *J. P. Berger, Éclaircissement sur l'Asphyxie par Submersion*, Genève, 1800; *Goodwyn's Constructions of Life with Respiration*, p. 19.)

When the person, at the time of falling into the water, was intoxicated, stunned by a blow on the head, or in a state of syncope, there can have been no struggle. Under such circumstances, the trachea will contain a little water, but not froth; the lungs will be of their natural colour, and not much expanded; no water will be found in the stomach; and the blood in the venous system will not be so disproportionate to that contained in the arterial. As Dr. Rogee justly observes, the great discovery in these and other circumstances "will enable us, perhaps, to explain the differences that are met with in the time during which the body may remain under water compatibly with the possibility of restoring life. If the submersion have not exceeded five minutes, and no blow against a stone or other violence has occurred to counterbalance the effects, our efforts at resuscitation, if properly conducted, will generally be successful. After a quarter of an hour, recovery is not very common; after twenty minutes or half an hour, it may be considered as nearly hopeless. The longest pe-

not recorded in the Reports of the Bannock Society is three quarters of an hour. On the other hand, some, who have been only a few minutes under water, cannot be restored to life, even by the prompt application of proper means." (*Dr. Roger, in Cycloped. of Pract. Med.*, article *Asphyxia*.)

In the endeavor to resuscitate a person whose animation has been suspended by immersion, the wet clothes should be promptly removed, and the body covered with blankets and placed on a table, with the head and chest raised; the nostrils and mouth are to be freed from froth, and kept perfectly unobstructed. The lungs are then to be inflated with the kind of bellows employed by the Bannock Society, and provided with a stout flexible tube, one end of which is adapted to the orifice of the bellows, and the other to a silver tube, designed for introduction into the nostril. As the glottis is open, air, conveyed into one of the nostrils, while the other and the mouth are closed, and the larynx is pressed towards the vertebra, so as to close the oesophagus, must necessarily pass into the lungs. The wings being thus filled, are next to be emptied, by an assistant compressing the chest and expelling the air. The same operations are to be repeated until natural respiration begins, at which time and other approved measures have been tried at least six hours. (*Dr. Chervin, On an Asphyxied Dog*, &c.) When this method fails to fill the lungs with air, tracheotomy may be performed, but in the opposite case it is not necessary. As the body is insensible, there is, indeed, commonly little or no difficulty in passing any kind of tube of moderate diameter and proper length into the glottis when the tongue is drawn forward, and tracheotomy, under these circumstances, cannot be needed. Thus, with an ordinary silver catheter, air may be blown into the lungs. Together with inflation of the lungs, gentle friction of the body with warm flannels or the hand, stimulating the nostrils with hartshorn, and injecting warm stimulating fluids into the stomach with a syringe and tube passed down the oesophagus, are plans generally recommended. Slight shocks of electricity or galvanism through the breast and diaphragm may also be tried, if the apparatus be ready at hand.

After the breathing has been restored, the patient is to be watched, but he yet fall a sudden victim to a returning accumulation of black blood in the brain, or to the violent effects of reaction in the system.

The treatment of persons whose animation is suspended by strangulation is the same as that of persons in a similar condition from immersion. Here, however, the failure of the diaphragm of the brain may render bleeding indispensable.

In cases of asphyxia depending upon obstruction of the glottis, larynx, or trachea by disease, foreign bodies, or tumors, tracheotomy or laryngotomy, according to circumstances, is frequently the only means by which life can possibly be saved. (See *LARYNGITIS* and *TRACHEOTOMY*.)

The treatment of asphyxia from carbonic acid gas consists in removing the body immediately into the fresh pure air, sprinkling it with cold water if its temperature be high, giving it, and endeavoring to restore the breathing by blowing air down the glottis; oxygen gas, if at hand. Differences of opinion are entertained about the utility of bleeding.—C.]

(*ATROPHY* from α , privative, and $\tau\rho\phi\acute{o}$,

nutrition). A deficiency in the nutritive powers of a part, in consequence of which its natural dimensions are reduced, and the number of its constituent molecules diminished. (Treated in *Cyclop. of Prac. Med.* on *Atrophy*.) According to another pathologist, atrophy is degeneration of growth, deficiency in the size and weight of a part, and commonly of one or more of its usual constituents in particular. (*Magn. Oulien, of Human Pathology*, p. 16.) When the functions of organs cease or are long suspended, an atrophy of them usually follows. Thus, in a limb kept for a long while unexercised in consequence of disease, the bones suffer atrophy as well as the soft parts. But certain states of disease and injury frequently lead to atrophy of various organs and tissues. This fact is often exemplified in the testicle. Wounds of the scrotum and back of the neck were remarked as *Larrey* in Egypt to be often followed by atrophy of this organ. The want of a free supply of blood and nervous energy leads necessarily to weakness and atrophy of parts. In old age, various parts undergo what is termed *senile atrophy*. Thus is advanced life, the ovaries and mammary glands are reduced to mere rudiments.

According to Dr. Carnwell, atrophy "is the modification of bulk which takes place in consequence of a diminution in the quantity of the solid materials which enter into the healthy composition of organs and tissues." This diminution of bulk, which constitutes the essential physical character of atrophy, is described by him as depending upon diminished exercise of the nutritive functions. (See *Carnwell's Illustrations of the Elementary Forces of Disease*, p. 107.) In this valuable work, one of the most correct ever published on this interesting branch of pathology, notice is taken of certain forms of *essential atrophy*, as exemplified in anæsthesia, and anæsthesia the consequences of the forming process having been arrested at certain periods of the evolution of particular organs. Dr. Carnwell most ably adverts to the atrophy, or even total disappearance of organs, soon after birth, which performed functions essential to the sustenance of the foetus, but which are now no longer necessary to the maintenance of life, as the ducts of the testes, umbilical arteries, the thymus gland, supra-renal capsules, &c. Different from these two forms of atrophy is that which, as Dr. Carnwell observes, takes place in advanced life, "as the fulfilment of a general law of nature, as successively manifested in the limited duration of all organized beings, which, having attained the maximum of their development, decline after a variable period of time, and tend gradually towards decay." *Senile atrophy*, as Dr. Carnwell terms it, is carried to a great extent in the vascular structure of the lungs, the spongy structure of the penis, the testes, the lymphatic and mammary glands, the uterus, and ovaries. The heart, in general, loses much of its weight; and at every stage of its experience knows, *Larrey* of the neck of the thigh bone is peculiar common in old persons, in consequence of the effects of *senile atrophy*. After seventy, the testis is diminished from $\frac{1}{2}$ to $\frac{1}{3}$ of its average weight, and becomes specifically lighter, and the trunks and branches of the nerves are reduced in size. The muscles, especially those of voluntary motion, participate likewise in the general decay, and so do the bloodvessels, which always bear a relation to the increased or reduced size of the organs to which they are distributed.

This fact is exemplified in the size of the large, or the number of small, arteries being lessened. The general antemortem absorption of John Hunter, the atrophy of the whole body, or the inanition and emaciation from diseases deranging the important functions of digestion, respiration, and the qualities of the blood from leucæmia, putrid suppuration, and various fevers and organic diseases, I need not enumerate in this place. But, besides these forms of atrophy of

forming the white body, there are others which are local, and divided by Professor Cuswell into three classes:—1. Atrophy from a diminished supply of blood. 2. From diminished exercise of the function of nutrition. 3. From diminished exercise of the functions of the organ. For numerous original, philosophical, and practical remarks on these heads, I refer to Cuswell's *Illustrations of the Extreming Power of Disease*, fasc. 10.—C.]

B.

BANDAGES. The surgical world are indebted to Professor Duff, of Kentucky, for the first estimation and extensive adaptation of the bandage as a therapeutic agent. Its early application after recent injuries and operations will be found of great assistance in controlling the circulation and facilitating the cure.

During the year 1830, Dr. H. Chase, of Philadelphia, introduced to the profession a novelty in the construction of suspensory bandages. He substitutes non-elastic (linen) bandages for those commonly made of silk, cotton, or other elastic materials. They vary in shape, both those extraordinary size, the size in each instance being adapted to the size of the scrotum, and the band supporting the sac passing upward over each groin, and around the body above the anterior superior iliac spine process of the ilium.

The principle of action resides in the constancy and immovability of the support and pressure, by which the undue contents of the enlarged spermatic veins are expelled from these vessels. He has seldom found these bandages useful in relieving patients from all the painful symptoms attendant upon varicose, and, in an equal number of cases, to eradicate all traces of this complaint.

A full description of this instrument, together with its mode of action, is given, accompanied with cases, in the Appendix to the *Final Report of the Committee of the Philadelphia Medical Society on the Radical Cure of Hernia by Truss*. Republished, with Notes, by Hiler Chase, M.D., p. 217.—Review.

[BLADDER. The operation of cutting into the membranous portion of the urethra, behind the stricture, seems to me one of the greatest improvements in modern surgery; for, as it is chiefly in a few cases of stricture that an artificial urethra for the time is required, the new plan, which, as compared with a wound of the bladder, is a trifling injury, readily obviates all necessity for penetrating the bladder in any way.

This plan was first adopted and recommended by Sir Astley Cooper, and it afterward had an advocate in Sir Charles Bell.

I lately placed in the Museum of University College a scirrhous testis, which I found in the bladder of an elderly man, whose thighbone broke as he turned himself in bed, in consequence of being weakened by the presence of a cancerous tumour upon it. (*Sir Med. Cur. Trans.*, vol. xvii., p. 51.)

BLADDER, HERNIA OF. See HERNIA.

Besides this case, the bladder in females is liable to prolapsus and inversion, through the menstrual currents.

BLADDER, HYDATIDS FORMED FROM.

This case is exceedingly rare. In one example, under Dr. Denon, the hydatids discharged from the vesicles were formed in the kidney. The symptoms were frequent desire to make water, and sometimes difficulty in making the evacuation, and pain about the tip, perineum, and clitoris. The pain in the perineum was generally felt six or seven hours before each hydatid was expelled. The expansion of the hydatids was pointed out by exhibiting twelve minims of diluted muriatic acid three or four times a day. The hydatids varied from a globular shape, and of the genus acanthocyst, and varied in size from that of a pea to that of a pigeon's egg. Probably they had enlarged after their descent into the bladder. (*See Liverpool Med. Journ.* for July, 1831.)

The following curious account of the post mortem appearances is an instance of this kind is given by Dr. Tyson: "Thereto, upon operation (says Dr. Tyson), we discovered a very strange sort of cysts, or bags, of the exact figure of eggs, of several diameters, some larger than goose eggs, others as big as hen eggs, to the number of twelve in all; and about eight of them white, and coped with large semis; all of them loose and free, without the least adhesion, either to one another, or the coat of the bladder. Nor could we imagine that this miserable patient could possibly make any water but what happened upon the breach of some of these watery tumours, when the bladder was crushed beyond its dimensions. The tumours were of the largeness of the small guts in children, so that they could easily admit two fingers into their cavity. One of the vesicles being opened, had a large cluster of small ova, as big as grapes, all coped with liquor. All the rest contained nothing but mucus." (*2 years in Philad. Trans.*, 1687.)

BLADDER, IMPACTS DISCHARGED FROM.

About two years ago I received from Mr. Law, of Penryn, Cumberland, many specimens of calcifications washed from a young woman's bladder, supposed by him to be portions of testis. But, on submitting them to the examination of Mr. Richard Owen, at the College of Surgeons, he ascertained, perfectly to his own satisfaction, that the substances were only pieces of the trabeculae of pyramis, or other small parts, cut and prepared so as to bear some resemblance to testis; and, consequently, that the woman is guilty of some trick imposture, from moroseness or other inexplicable cause. Mr. Law seems convinced, however, that the case is different from the view of it taken by Mr. Owen.

BLADDER, RUPTURE OF THE.

Many examples of this accident, occasioned by blows, or sudden violent pressure on the hypogastric region, and followed by fatal extravasation of urine, are on record. So fatal is the occurrence, that Dr. Harrison is not aware of any instance, the particulars of which are published, having had a favourable termination. (See *Dublin Journal of Med. Science*, vol. ii., p. 320.) The urinary bladder, in its empty and contracted state, as he correctly observed, lies so deeply in the male pelvis as to be almost perfectly secured against any injury or accident except that of a gunshot wound or a surgical operation. When, however, it becomes distended with urine, it rises up above the pubes, presents forward against the abdominal muscles, and is in a position much exposed to external injury. In this state, also, its coats are tense, expanded, and thin; conditions in which their tissue is more easily ruptured. Excluding from present consideration penetrating wounds and lacerations by spiculae of fracture of the os pubis, the bladder is generally burst by violence, applied directly to the hypogastric region, as by a blow or fall on this part, or the heavy pressure of a cart or carriage wheel. In the museum of University College are two specimens of ruptured bladder; in one the accident was occasioned in the following manner: a man who had been drinking, and whose bladder was very full, went out of the house where his party was, but it being dark, he struck the hypogastric region against a post which he did not see. The consequence was the rupture of the bladder. The other specimen was taken from a fine young man, a patient of my own; the injury having occurred whilst the bladder was very full of urine, as he was wrestling with another person, whose knee, in the fall, made violent pressure on the abdomen, just above the pubes. Also, the accident has sometimes been caused by a general concussion of the whole frame, such as a fall from a height, without any direct force acting on the caecal region itself. (See *Chambers's case in Dublin Hospital Reports*, vol. ii.) Again, the bladder may be ruptured by violent exertion, and repeated straining to urinate it when overdistended, in consequence of some obstruction to the flow of urine, or during the violent effects of parturition. Lastly, it sometimes gives way from gangrene, when it has long been in a state of forced distension, or when, being in a state of ptosis, it is subjected to the long-continued pressure of the uterus during a protracted labour, or, in the earlier periods of stove-potition, to the pressure on it caused by a retroversion of the womb, as exemplified in the cases recorded by Dr. William Hunter. (*Med. Obs. and Inq.*, vol. ii., and v., Lond., 1771; *Harrison in Dublin Journal of Med. Science*, vol. ii., p. 322.) In retention of urine, a rupture of the bladder from straining to urinate, is but a common event. One instance of it is mentioned by Sir Benjamin Brodie (*On the Use of Urinary Organs*, p. 27), and another by Sir Keppell Home. (*On Stricture*, vol. i., p. 240.) But, as Dr. Harrison observes, it is doubtful whether, in the latter case, the opening in the bladder was the effect of a violent laceration, caused by muscular exertion, or of some preceding oblique or gangrenous affection of the particular point where the organ gave way. Generally, however, as retention of urine from stricture, when the urine becomes effused, it is not from a rupture of the

bladder, but from that of the urethra behind the stricture, or in the immediate vicinity of the prostate gland. (*Harrison in Dub. Journ. of Med. Science*, vol. ix., p. 322.)

It would appear from Dr. Harrison's observations, that, when the distended bladder in the male has been ruptured by a fall or blow on the hypogastric region, or by a general concussion, that portion of it which is bounded by the peritoneum has very generally been the seat of rupture; the urine has consequently been effused in the abdomen, and the patient has been destroyed by peritonitis (p. 324).

The following is the explanation offered by Dr. Harrison of the fact that, when the bladder is ruptured by a blow or general concussion, the laceration is always found in that part of the organ which is covered by the serous membrane. "The several tunics of the bladder allow of considerable distention, but least of all the peritoneal: when, therefore, the bladder becomes fully distended, and is then subjected to any sudden or violent compressing force, this tunic, which is then tense, and comparatively unyielding, will crack, while the subsequent tunics which are connected to it will be torn along with it; whereas, in other situations, when cellular tissue occupies the place of the serous membrane, the coats of the bladder will yield considerably before they give way or admit of laceration." (See *Dublin Journal of Med. Science*, vol. vi., p. 321.) The bladder being perched forward against the prominence of the os pubis in the male, seems to Dr. Harrison also to account for the rent being usually in the posterior region of that tunic. The entry of the accident in females is ascribed by him to the greater size of the pelvis, the cavity of which is yet so imperfectly occupied by the bladder when this is full of urine. Nor (says he) does the bladder incline so much backward as in the male; on the contrary, it inclines more forward, and enlarged more in the transverse direction, while the uterus and associated broad ligament serve to break the shock of any external violence applied to the hypogastric region, and so prevent the direct concussion of the bladder across the sacral promontory." (Vol. vi., p. 321.) The comparative infrequency of a rupture of the bladder in children and boys is ascribed by Dr. Harrison to their rarely suffering the bladder to become much distended with urine, and to put to the smaller size of the sacral promontory, and to the bladder, when full, lying in early life more in the abdomen.

With respect to the diagnosis of the kind of rupture of the bladder now under consideration, it is judiciously observed by Dr. Harrison that, as it is the effect of only two species of injury, the account of the accident will afford useful information. Thus, says he, every case on record has been the result either of some force directly applied to the abdomen, or of a general concussion of the whole frame. In this latter case the injury is more likely to be overlooked, particularly if the individual has suffered in any other and more obvious manner; hence, after such a calumny, the attention of the practitioner should be early directed to the urinary discharge, and, if there be any inability to pass the urine, and a desire to do so, the catheter should be introduced. When the rupture has been the effect of violence directly applied to the hypogastric region, the symptoms are more obvious. The patient himself is often aware of the accident; he knew that his bladder was full at the time of

the injury; perhaps he felt it burst within him. Then the sensation of sinking and sickness, the pain in the abdomen, and the peculiar feeling about the perineum, are all circumstances indicative of the rupture of a blood vessel. In addition to these symptoms, there will be a desire to make water without the power of doing so; great pain in the body and perineum during the attempts to urinate; at the bladder, the fulness being difficult and not circumscribed, as in common retention of urine. When a catheter is introduced into the bladder, it meets with a peculiar resistance, and the urine flows through it, not in a stream, but as if it merely filled and overflowed the instrument slowly, some time only in a few drops, at another in considerable quantity. "This difference depending on some alteration in the direction of the instrument, or in the degree of pressure with which it is pushed against the bladder, whereby the relation of the rupture must be ascertained, and more or less of the abdominal and pelvic urine be discharged." (See *Harrison in Dub Journ. of Med. Science*, vol. ix., p. 277.)

In the case, recorded by Mr. Casack, only a few drops of urine could be drawn off with the catheter on the day of the accident. On the next as much flowed at first; but, by changing the direction of the instrument, and on making pressure with the finger in situations, those few were discharged. On the third day, as all the symptoms continued unabated, the abdomen was punctured in the lower left, midway between the umbilicus and the pelvis; and a large quantity of clear urine issued, and, at the same time, it flowed freely from a catheter pushed in. The relief was only temporary, the patient having died delirious on the eighth day. On dissection, marks of intense inflammation were noticed in the hypogastric region, where the intestines were glued together into one mass. At first no urine was seen, but, on breaking the adhesions and raising up the intestines, about a pint of it was spunged out from between the rectum and the bladder. "The pelvic portion of the peritoneum was completely coated with lymph; the bladder was contracted and empty; the rupture, about an inch in extent, was in its posterior part and right side, and in an oblique direction." (See *Casack in Dub. Hospital Reports*, vol. i., p. 312.)

In the post mortem examination of a case under Dupuytren, traces of severe inflammation were observed in the hypogastric region. Adhesion existed between the abdominal paries and the bladder, and the sides of the latter and the adjacent viscera were all so agglutinated together, that a kind of pouch was formed, considerably advanced in organization, whereby the urine was circumscribed, and effusion to any further distance prevented. (See *Archives Gén.*, June, 1834, p. 281.) In general, the bladder, through the seat of injury, is small but little inflamed, except at the posterior portion of its serous coat. (See *Harrison in Dub. Journ. of Med. Science*, vol. ix., p. 276.)

In the treatment, the principal indications are to withdraw, if possible, the effused fluid from the abdomen; to prevent, if possible, any return or increase of such effusion; and to resist and subdue that irrepressible and very fatal affection peritonitis. With this view, any accumulation of urine in the bladder should be prevented by the introduction of an elastic gum catheter of full size, with a long and large curve; and if, by changing its direction or other measures, its

neck can be passed through the rent, or made to reach its vicinity so as to open it, a considerable quantity of urine may be drawn from the cavity of the peritoneum. Pressure with the finger is and is also to be tried. (See *Harrison*, vol. ix., p. 279.) In the case which I attended, a catheter of full size was kept continually introduced, in this way we endeavored to lessen the exciting cause of the inflammation, which, however, is sure to follow the effusion of an irritating fluid as the urine. Inflammation must, therefore, be treated by local and general bleeding; calomel, opium, and mild saline purgatives given with the refrigerating mixture. If the disease advance, and the pain in the abdomen become more intense, with swelling and distention, ought the surgeon to perform paracentesis? As Dr. Harrison remarks, this has been done in two instances, but without success. "The urine which is effused is principally lodged in the pelvic cul-de-sac, and is more or less confined to that region, partly from its depending position, and partly from the adhesions which, we have reason to expect, under proper and active treatment, may have been formed between the bladder and the adjacent viscera of the upper orifice of the pelvis." This view leads Dr. Harrison to consider cutting a small opening through the rectum into this cul-de-sac the best and safest plan for the discharge of the irritating fluid. Here a new cavity has been formed, covered internally like an abscess; and the opening is not to be regarded as extending into the general cavity of the peritoneum. The operation might be done with a trocar, or a long curved bistoury, with a sheath, and a cutting edge only on its extremity. The patient being in the recumbent posture, with his knees drawn up and somewhat separated, the finger of the left hand might be passed up the rectum as far as possible, and forced against its fore part. The catheter in the bladder might also assist in guiding the finger to the cul-de-sac behind that organ. The cannula of a long curved trocar might next be passed along the finger, and, when its extremity had been placed against the fore part of the rectum, exactly in the median line, the stylette might be pushed through it, and the peritoneum opened. Dr. Harrison conceives that the quantity of effused fluid would protect the small intestines from reach of the instrument; and he says that in the cases which he has examined, he did not find any of their convolutions in the pelvis. Supposing this opinion were ever attempted, ought the cannula to be left in the part? or ought it to be withdrawn, and the catheter trusted to for the prompt discharge of the urine afterward? The latter method is preferred by Dr. Harrison. (See *Boer, Med. Obs.*, t. ix., p. 61; *C. Matignon in Med. Communications*, vol. 2., p. 284; *Casack in Dub. Hospital Reports*, vol. i., p. 312; *Dupuytren, Archives Gén.*, June, 1834, p. 281; *Jackson in New. of Med. Soc. of Lond.*, vol. iii., p. 543; and particularly *Dr. Harrison's Case and Obs. in Dub. Journ. of Med. Science*, vol. ix., p. 248, in which I am indebted for the chief information in the foregoing article.)—C.T.

BLEPHAROPLASTIC. Doctor Alfred C. Pool, of New-York, has cured two aggravated cases of ectropion of the lower lid, occasioned by the contraction of cicatrices, resulting from burns, by means of the blepharoplastic operation. An incision was first made by which the lid was detached from the cheek throughout nearly its whole extent. A triangular portion of

the everted lid was then secured, and the edges of the wound in the lid brought together with a suture. A vertical flap was then formed from the integument, covering the nuchal muscle, and sutured upon itself so as to be inserted between the lid and the cheek, where it was retained by sutures. The edges of the wound from which the flap was taken were also brought together in a similar manner. The deformity resulting from the excision after the healing of the wounds was very trifling, compared with that which had been removed by the cure of the ectropion.

An account of the first of these cases was published, with engravings, in the *New-York Medical Gazette* for January 19th, 1842.

During the last year, Dr. J. M. Warren, of Boston, has performed this operation for restoring the lower eyelids, which had been partially destroyed by burns, in two cases with entire success.

Dr. Geo. McClellan, of Philadelphia, has repeated this operation fifteen times, and with the most gratifying results in removing frightful deformities.

Dr. Mutter, of Philadelphia, has also operated in several cases with gratifying success, and Dr. Horner, of Philadelphia, reports a successful case in the *American Journal* for 1837.—[Edison.]

[DILATERS. In the North London Hospital, the nitrate of silver is often used for making blisters, as particularly recommended by Mr. Higginbottom. It causes less irritation, and its effects are more prompt than those of cantharides. It may also be used in persons in whom cantharides produce strangury. It excites a copious discharge, without heat or pain after the first few hours, and the vesicated part heals about the fifth day, no suppuration having been occasioned. (*See Hypodermic use of Nitrate of Silver*, p. 161.) By means of the application of diluted silver, repeated every six or eight days, and of perfect quietude of the part, secured by means of a splint and bandage, many a diseased joint has been cured in the North London Hospital.

"In applying blisters to infants," says Dr. Cumming, "we must take particular care not to allow them to remain on for more than three or four hours. When a blister is applied for a longer period, excessive general irritation is apt to be induced; and such is the delicacy of the infant's skin, that the blistered parts not infrequently become gangrenous. Under such circumstances, the death of the child has been sometimes the consequence. Though vesications may not have formed at the time when the blister is removed, they generally take place after the application of the dressing. In some habits the blistered surface takes on an unhealthy action, and runs into eating and antiseptic ulcers, which are long in healing. In such cases I have found an emollient poultice when the inflammation is considerable, and afterward the black and yellow ointment, the most useful applications. In infants of an irritable habit, it will sometimes be advisable to dilute the blistering plaster with an equal quantity of the emplastum cantharidis." (*Ob. Essaying in Theory of Acute of Coll. of Physicians, Ireland*, vol. 8, p. 55.) *See Parry's Pharmacology*, vol. 6, p. 186, ed. A. A. T. Thomson's *Dispensatory*, and *Elements of Mat. Med.*, ed. 2. *See Hypodermic use of the Nitrate of Silver*, p. 161, ed. 2, 8vo, 1829. *May's Outline of Human Pathology*, ch. 1.—C.)

[BONES, EXCISION OF. This operation is sometimes applicable to the articular portions of

bones, but still more frequently to other parts of them. The circumstances under which it is performed for the removal of diseased or very severely injured joints, and the plans then to be adopted, will be hereafter considered. (*See JOINTS, EXCISION OF*.) Neither shall I dwell upon the removal of the projecting ends of broken or dislocated bones, nor upon saving of the extremities of old ununited fractures (objects noticed in the account of *Dislocation and Fracture*). In the articles *Amputation* and *Gun-shot Wounds*, I have called the reader's attention to the presentworthy method of cutting down to, and removing all loose splinters of the os trephos, and even the sharp ends of that bone itself, from certain gunshot injuries of the shoulder, as so frequently to obviate the necessity of amputating the limb. The cases demanding the removal of portions of the skull, and the manner of accomplishing it, will be described under the head *Trephane*. Towards the conclusion of the observations upon *Amputation*, some account has already been given of the manner of certain kinds of the hand and foot. It is difficult, as M. Malgaigne observes, to lay down any precise directions for the removal of the bones of the femur. The following plan was adopted by M. Roux, the father, by an extensive class. Over the cuboid bone there was first a line in inch diameter, and another between the third and fourth metatarsal bones, resulting from an incision made a few days previously for the discharge of an abscess. A probe penetrated into the cuboid bone. An incision was made along the inner side of the foot, and extended across the wrist, from the posterior third of the fifth metatarsal bone to above the anterior tubercle of the os calcis; and, as the incision already made for the abscess could now be made serviceable, this and the other incision were completed by a transverse cut, and the square flaps reflected. The diseased bones were thus brought into view, and it was necessary to remove the cuboid, the third cuneiform, the posterior end of the fourth metatarsal bone, the inner side of the extremity of the fifth, and the articular surface, by which the os calcis is united with the cuboid bone. The tendons of the peroneus longus was preserved. The flaps were then laid down, and united with two sutures. The patient, who was young, got completely well. The vacuum occasioned by the extraction of the bones was filled up by a substance which afterward ossified. In the end, the patient was able to walk well, the foot having retained its natural shape and motion. (*See Malgaigne, Mem. de Méd. Opér.*, p. 231.) The operation of removing the metatarsal bone of the thumb, or the metatarsal bone of the great toe, is not deemed by Mr. Liston an advisable proceeding, because the rest of the thumb or toe is left without support, and is useless. He has seen cases treated in this way, but the result was unsatisfactory. However, Mudge removed the whole of the first metatarsal bone on account of cancer, and M. Harter did the same thing at the Val de Grâce after a dislocation of the bone, and in both cases the result was in every respect successful. (*See Malgaigne, Op. cit.*, p. 244.) The extraction of the metatarsal bone of the thumb has been performed with success by M. Roux and M. Blandin. The thumb was at first shortened and useless, but gradually became capable of executing all its natural movements. (*See Malgaigne, Mem. de Méd. Opér.*, p. 232.) An incision is to be made along the radial edge of

the bone, and to extend about half an inch beyond each of its articulations. Then the integuments and exterior tendons are to be detached from its distal, and afterward the muscles from its palmar surface. While an assistant holds aside the flap of the wound, the surgeon opens the outer side of the carpal joint with the point of the knife, cuts through the tendon of the long abductor, which is inserted into the metacarpal bone, and then carries the knife completely through the joint. He now tries to dislocate the bone outward, and to pass the knife along its inner side, so as to effect its total detachment from the carpalæ. Lastly, the articulation with the first phalanx is opened by cutting in succession the internal and external lateral, and the anterior ligaments. The radial artery may be avoided, but, were it wounded, the application of a ligature to it would be attended with no difficulty. The second is to be brought together, and the thumb supported in its natural position with soft pads placed in the palm. (See *Malpighi, Op. cit.*) *Excision of the anterior portion of the first metacarpal bone* seems to M. Blandin advantageous, because, when the root of it can be saved, the foot remains with a more solid support. A flap is formed at the inner side of the bone, with its base backward. The bone is exposed to the point where it is intended to divide it; even perpendicularly to its axis; then, detached from its connections from behind forward; and, finally, disarticulated from the phalanx. With respect to the phalanges of the other four toes, amputation is commonly preferred to excision of them; and so it is to excision of the heads of their metatarsal bones. (See *Malpighi, Op. cit.*, p. 262.) Although the removal of the metacarpal bone of the index and little fingers may easily be performed, by cutting along the outer margin of it, M. Malpighi is probably correct in stating that such an operation, in consequence of the subsequent shortening of the finger, would leave after it as much deformity as amputation would produce, and even greater weakness of the hand. This observation is not applicable, however, to the excision of the metacarpal bones of the middle and ring fingers, which will still retain their connection with the contiguous ones, and the strength of the hand be preserved. An incision is made along the dorsal aspect of the bone, by the side of the extensor tendon, which should not on any account be divided, and the disarticulation is to be begun at the knuckle. (See *Malpighi, Mem. de Med. Opér.*, p. 233.) The removal of dead, or softened and carious portions of the carpal and tarsal bones, Mr. Liston admits, is sometimes successful, but operative interference with these, or with many extensive and firm articulations, is not advisable, unless the soft parts be not largely involved, and the general health tolerably good. If the ligaments, nerves, and cellular tissue are much affected, Mr. Liston considers the chance of the discharge ceasing and of the return of health entirely hopeless. Amputation above the diseased parts will still be indispensable; and, in consequence of the more reduced and debilitated state of the constitution, this second operation is less likely to answer than if it had been undertaken earlier. (See *Liston's Essay*, part iii., p. 398.) It is right to mention, however, that after removal of the first phalanx of the thumb and the extraction of the fragments, M. Velpeau has known the part regain its motion. If an incision were necessary for the removal of the phalanx, it

should be made along the radial side of the thumb, and the metacarpal articulation, which is the looser one, being opened first, the phalanx should then be inserted outward, and dissected out. (See *Malpighi, Mem. de Med. Opér.*, p. 231.) In a few cases, Mr. Liston has removed several of the tarsal and carpal bones, as practised by Mr. Dunn, of Scarborough (see *Amputation*), in others, one, or a portion of one, with success. In one instance the greater part of the sesamoid was taken away along with the ends of the tibia and fibula. These contained a large opening across the joint, through which a seton was passed, to promote the gradual and piecemeal discharge of the remaining portions of diseased bone. The articulation could be seen through. The seton was gradually diminished, and the aperture closed. The foot was preserved, and the leg was somewhat shortened, but the limb proved extremely useful, though the ankle retained little power of motion. Mr. Liston, as well as many other surgeons, has also performed the *ex arthro*, and removed large portions of it. He has likewise taken away the cuboid bone, along with the base of the metatarsal bone or bones in connection with it. In some of these cases an excellent cure followed; in others, amputation of the foot was afterward necessary. (Vol. cit., p. 399.) Examples of the removal of extensive portions of the *ex arthro* are reported by Hey, Moen, and M. Roux. In the North London Hospital there was a young woman, in 1835, from the outer part of whose os calcis Mr. Liston removed a considerable piece with a trepan. The cure was a scrofulous canker. Some amendment followed; but the canker penetrated too far to admit of complete removal in this manner. A fine specimen of the same thing was lately put into my hands by Mr. Moen, of University College, the part having been finally amputated in the Newcastle Hospital. In one case, where the scapular base of the scapula was dislocated by an injury, occasioned by machinery, Sir Astley Cooper successfully removed that bone. The rule proposed by him for any analogous case is to take away one, or even two of the carpal bones, if displaced; but, if the mischief is greater, to amputate.

I am not disposed to bestow much commendation on such an operation as the *excision of the ribs*, notwithstanding the high and respectable authorities which may be quoted in sanction of it, with the exception of its performance in cases where a sequestrum is nearly or entirely loose. The most remarkable excision of the ribs yet recorded is that performed by Mr. Richardson, in 1818, on a medical officer, who was afflicted with cancer of the thorax. The middle portion of four ribs was removed to the extent of several inches. It was also necessary to extirpate the contiguous part of the pleura, which was very much thickened, and transformed into a cancerous substance. Thus the polypations of the heart within the pericardium were brought completely into view. The case afterward went on favorably for a time, but in the end proved fatal by a return of the cancerous disease. I strongly need advise British surgeons not to attempt any similar operation where the disease of a rib, or, indeed, of any other bone, is the effect of a primary cancerous affection of the soft parts. Such an experiment must inevitably terminate in the return of the original malignant disease, unless the patient's accelerated death happen not to leave sufficient time for this result. These observations are directed chiefly, however, to the

particular case here specified; and as the extraction of portions of ribs has been performed by several eminent surgeons with success, I conclude that circumstances may occur in which the plan is judicious. Not to lay any stress upon the instances of the practice in ancient times by Galen, Astruc, Sedillier, Lacet, Ferriar, &c., it has been twice resorted to subsequently by Richardson's operation, and with success, by Atanasi in Italy; also in the Hospitals Beaujon and La Charité at Paris, and by Dr. Mott, of New-York. The operation consists in extending the incision through the soft parts behind the extent of the diseased portion of the rib, both in front and behind, and then, after detaching the bone from the pleura at the point where it intended to divide it first, it may be sawed through with one of Hey's saws, or what will be more convenient, divided with a pair of cutting pliers. The divided end of the bone should then be united outward, and separated from its connections, so as to facilitate the safe division of it beyond the extremity of the disease. A principal thing in the operation is to avoid injury of the pleura as much as possible.

In 1825, the removal of the scapula was accomplished with complete success by Dr. R. Bell, of Virginia; and in 1826, M. Velpeau had a case in which he was desirous of performing a similar operation, on account of disease entirely restricted to that bone, but the patient performed amputation. (See *Velpeau, Nouv. Éléms. de Méd. Opér.*, t. 2, p. 365.) An incision is made along the outer and anterior part of the scapula. The edges of the wound are to be held apart, and the muscles detached from its anterior and posterior surfaces a little below its middle part, where it is most superficial; a chain-saw is to be used; a director now being introduced on the outer side of the bone, will serve to convey the chain-saw behind it. In the place specified, the bone is sawed through, and the two fragments carefully dissected out. If sufficient ribs were not obtained for the action of the saw by the longitudinal incision, a transverse one should also be made. (Velpeau, &c.) A strong pair of cutting forceps would divide the radius with less difficulty than a chain-saw.

In an example of removal of the outer third of the clavicle, M. Velpeau removed the scapular portion of it. Two incisions in a cruciform form, and four inches long, were made, the flaps raised, the acromio-clavicular ligaments, and some parts of the origin of the deltoid and trapezius divided. The bone was then raised with a lever passed into the joint, and its detachment completed. M. Malgaigne conceives that a better plan would be to make first an incision parallel to the clavicle, but a few lines below it, and ending at the acromion, and then another shorter one at a right angle with this extremity of the first, so as to form a triangular flap. Instead of a chain-saw, the clavicle may be very safely divided with one of Hey's saws or a pair of cutting pliers, care being taken to pass a flexible copper spoon under the bone to protect the subjacent

parts from the saw. The interosseous ligament was torn through, so as to free the distal end. The patient was alive six years, when the operation, and in good health.

The whole clavicle affected with osteosarcoma was removed by Dr. Mott, of New-York. The tumour was of the size of two fists and reached upward nearly to the hyoid bone and angle of the jaw. A semicircular incision, with its convexity downward, was made below the swelling, from one end of the bone to the other. Another incision was next made above the tumour, from the acromion to the external margin of the external jugular vein. The platysma, and a portion of the trapezius having been divided, a director was passed under the bone near the acromion, and a division here effected with a chain-saw. Not being yet able, however, to display the tumour, Dr. Mott, with the aid of a director, extended the first incision toward it, and having applied two ligatures to the external jugular vein, and cut it through in the interspace, he next divided the clavicular portion of the sternocleidomastoid muscle, and found it necessary, also, to use and divide the internal jugular vein. The clavicular vein, and therefore duct were separated from the diseased parts with the handle of the scissor. Lastly, the great pectoral muscle, the costo-clavicular ligament, and the serratus muscle having been divided, the disarticulation of the distal end of the clavicle was accomplished. The bleeding required forty ligatures in its suppression. In six weeks the wound was nearly healed, and the patient afterwards, with the aid of a mechanical substitute for the clavicle, retained the power of moving the limb with but little impediment.

The removal of the scapula to a greater or lesser extent, has been performed on several occasions. In one instance, a considerable portion of the scapula was removed by M. Jansen, on account of a tumour involving it. Two semi-elliptical incisions were made so as to circumscribe the swelling; as much skin as possible was dissected up and saved; the tumour and bone were then detached from their connections in every direction, as low down as the linea sub-scapularis. The attachments of the trapezius, supra and infra spinatus having been divided, and the portion of the bone above the spine ascertained to be sound, all the other diseased part was sawn off, and the shoulder-joint left uninjured. One more incision was necessary to expose the whole of the tumour, and facilitate its excision. The wound was altogether six inches in breadth and nine in length. The motion of the shoulder was preserved. A large tumour of the scapula was removed two or three years ago by Mr. Ernie, but, as the disease returned, Mr. Ernie removed it a second time, together with the greater part of the scapula. The disease, however, being of a malignant character, again returned, and proved fatal. Several cases of this description have been lately met with in the hospitals of this metropolis. One was in the South London Hospital, under Mr. Lister. I found it another in the Westminster Hospital.

Removal of the whole of the skull, with the exception of its base, was performed by M. Simon. The particulars are related in M. Malgaigne's Manual. Many arteries required ligation, and among them, the posterior tibial. The internal pudic nerve was also divided. As the skin was slightly affected, the cautery was applied to it. In two months the wound was healed, and

as fear the patient could bear nearly as well as this leg as on the other.

In the articles *Amputation*, and *Gnathic Wounds*, I have noticed the excision of the upper head of the humerus; and in *thickened Anchylosis* an account is given of Barton's section of the head end of the femur, an operation to which an allusion is made in the writings of C. White, of Manchester, and which has been performed by Sir Benjamin Brodie, Mr. Anthony White, and in Germany by Oppenheim. Sir Benjamin Brodie lately informed me that his patient died some time afterward of phthisis. I believe the case was one in which it was ascertained that the disease was restricted to the head of the femur. My friend, Mr. Anthony White, has favoured me with the following particulars of the case in which he performed the operation. John West, a twin of delicate make, was born and reared in Westminster. When between five and five years old, he suffered from scrofulous inflammation in the left hip-joint, which passed through the stages of enlargement, calcification, and subsequent perforation, and the femur was finally lodged in a very high position, on the dorsum of the ilium. About three years subsequent to the commencement of the disease, and when he was about eight years old, I first saw him. He was much emaciated; several abscesses had formed during this period around and over the diseased structure, leaving many fistulous openings, through which the pus-sometimes detected the surface of the displaced bone to be in a state of caries, and several small cysts had excoriated from the ilium, ischium, and on perine, over which bones abscesses had formed. In the progress of the disease, the knee of the affected limb had become inverted, and firmly imbedded on the lower and inner part of the opposite thigh, from which position it could not be removed, and every attempt to do so was accompanied with exquisite pain. All further attempts, therefore, were abandoned, and the limb left undisturbed. He had now been nearly three years on the opposite side, with the body considerably incurved, and without the power of changing his position. A profuse and debilitating discharge was constantly issuing from the numerous openings leading to the carious surface of the displaced bone. In other respects, the health of the boy was tolerably good. Reflecting on this poor boy's case, it was evident that, unless the knee could be removed from its firm lodgment on the opposite thigh, he must remain in the position above described during the remainder of his life, and this could only be effected by removing the upper portion of the femur, which, from its fitting mobility, induced the belief that a firm union was taking place between its under surface and that of the ilium, with which it had been long in contact, and the form of which was very apparent under the thin integuments with which it was covered. Considering, also, that, as an entire destruction of every bone which forms a healthy joint had taken place, no danger could be reasonably entertained from meddling with parts in their existing condition, and attempting the removal of the head of the displaced bone; and, further, that the strength of the boy, from the profuse discharge kept up by the caries of the bone, was never likely to be restored, I was induced, after mature reflection, to propose an operation for the removal of the upper part of the femur as far as it should be found in a state of caries, which, from examination with the probe,

appeared to extend probably a little lower than the great trochanter. If this could be accomplished, it would set free the lower portion of the bone imbedded on the opposite thigh, and enable me to draw outward the whole limb, and possibly place the boy in a condition rapidly reconcilable with those cases, where a similar disease had occurred, and in which a compensatory joint is formed, on which locomotion is effected with or without the aid of a crutch. I proposed to divide the integuments covering the bone, beginning above its head, which was easily detected, and carry it downward in the centre as far as might be found necessary, and separate the soft parts from the shaft of the bone towards either side. I then proposed to divide the bone at the lowest exposed part with a small saw, and to elevate it with a lever from the dorsum of the ilium. I hoped that the wound would heal over the divided end of the bone, which (now being set free) might be brought into a straight line, and which motion would incline deeply into the wound the end of the divided bone. The wound itself was to be treated as a common incision with adhesive plaster and bandages, and need quietude. My colleague, the late Mr. Mead, saw the case, concurred in the proposition, and offered to be my assistant. The late Mr. William Smith, member for Norwich, and to whom the mother of the boy was well known, informed the late Sir R. Home of the proposed operation. The boy, at his request, was conveyed to St. George's Hospital, and, after an examination of the case with his colleagues, a written document, signed by him and them, was given to the mother of the boy, declaring that the contemplated operation would not only be useless, but impracticable, and more likely, if attempted, to attend with loss of life. I was not present at this consultation, and only knew of it by being shown this document or posted by the boy's mother. Of course, with such a published declaration, I abandoned the case altogether. After the lapse of some months, Mr. Travers, while attending at Mr. Smith's house in the city, to which the boy West had been removed with his mother, was requested to look at him; and being told of the proposed operation by the mother, who was an exceedingly intelligent person, at once saw and understood the principles and plan of the proposition. He subsequently wrote me a note, expressing his entire concurrence in the measure, and kindly offered to assist me in the operation, notwithstanding the formidable protest which had been issued shortly before. Glad of the concurrence of so distinguished an individual, and my own opinion as to its practicability being unchanged, I gladly accepted of the offer. A lodging in Westminster was procured for the boy and his mother. We met in consultation, and an early day was fixed for the operation.

In April, 1821, we met; and the boy being placed on a table of convenient height, I proceeded to divide the integuments covering the bone, carrying the incision from an inch above the head, directly along the middle line of the bone, about two inches below the greater trochanter. This was completed at one incision down to the surface of the bone. The integuments were dissected inward and outward, thus leaving the bone entirely bare a little lower down than the lesser trochanter, which was distinctly visible. A spatula was now placed under that part of the bone which was intended to be sawn through, so as to protect the structures under-

mouth. This was readily accomplished. A small-er spatula was then introduced into the space made by the saw, and used as a lever to raise the bone, which, with a little dissection, was removed from the dorsum of the ilium. No vestige of the abscessum remained, neither was any mass of the ilium discovered. The thigh was now readily brought into a straight line, and the knee flexed into its position on the thigh. The wound was closed by adhesive plaster, and no portion of the bone was left exposed. Splints and an eighteen-tailed bandage were applied, and the limb placed in the straight position. The boy bore the operation well, and not more than two ounces of blood were lost. The head, neck, and trochanters were very apparent, the caries being superficial, and not extending farther than the lower one. The case presented very favourably, and in a few weeks every sinus opening had healed, and also the incision made in the integuments. The patient rapidly acquired strength and flesh. At the end of two months I began to examine the parts, to ascertain if they had formed any attachment to the surrounding structures; and, on attempting to move the limb in different directions, I discovered that the boy himself had the power of raising the thigh upward, which power gradually increased, and, finally, a very extensive motion was accomplished by the spontaneous action of the muscles. I now proceeded to examine whether he could bear pressure upon the foot without inconvenience, which was the case at the expiration of about four months from the time of the operation. He was put on crutches, and in a very short time could bear considerable pressure on the foot, and at the end of a year he could walk on a high stump without his crutches. Finally, it was clearly ascertained that a new and useful joint had been formed, the boy being enabled to walk several miles without the aid of a crutch or stick. He acquired great latitude of motion, except in rotating the thigh outward and separating the thigh laterally outward. He was appointed to a lady's schoolmaster, and two years after the operation he became phthisical, and died of diseased lungs in the West-minster Hospital. The limb was removed with half the pelvis, and is in the possession of the Royal College of Surgeons; but the parts have not yet been examined, in order to ascertain the changes which had so usefully been employed in giving almost a perfect joint as a compensation for the original. The shaft of the femur appeared to have lost the power of further elongation; for, on disjunct-admersionment during the life of the patient, it was discovered not to have increased in length. Probably the fact is not generally known that bones do not increase in length after the ossification of their heads."

REMOVAL OF THE UPPER JAW-BONE.

In the article *Atrum*, certain stages of disease of this cavity are noticed, in which the only chance of cure depends upon the entire removal of the upper jaw-bone itself. I allude to osteo-sarcomatous fibrosis, and other tumours, which originate within the atrium, and by enlargement produce such an impediment of, and pressure upon the surrounding organs and textures, as must ultimately prove fatal unless a bold attempt be made to extirpate every part of the osseous structure, serving as a place of attachment to the swelling. Merely entering the alveolus and front of the nostril, and then attacking the tumour with the knife, cautery, or caustic, gener-

ally fails. Baron Dupuytren was led to suppose that by the excision of the upper jaw-bone an total extirpation might be performed with a successful result. He was induced to form this opinion from the consideration of the anastomosis on record, where the patients recovered after most severe mechanical injuries of the face and nostrils, occasioning the destruction of the bone. Camper mentions a case in which the whole of the bone came away in consequence of falling, and the patient was cured. Assuredly it would, indeed, to have actually removed the upper jaw-bone a tumour of the face as long as 10 1/2. Billroth and Deschamps also anticipated Dupuytren in the belief that the upper jaw-bone could be successfully extirpated, though they never undertook the operation themselves. The relations of the Family of Medicine at Paris from that Dupuytren removed, at all events, the greater part of the bone in 1824; but, as M. Pilon and Genoul contend, probably not the whole of it. M. Velpeau states that, in 1824, Mr. Roux, of New-York, removed both upper jaw-bones as far back as the pyriform process, and this without making scarcely any incision through the lip. (*New York Med.*, t. 1, p. 540.) In 1828, Mr. Lister also advocated the removal of the whole of the upper jaw-bone, and he performed the operation with success in 1825, 1828, and 1830. In May, 1837, M. Genoul, surgeon to the Hôtel Dieu at Lyons, removed every part of this bone, together with the whole of the palate bone, on account of a fibro-cartilaginous tumour, and the patient got completely well. (*New Velpeau, Ann. Elém. Méd. Opér.*, t. 1, p. 247; *St. Simon, Lect. Chir. sur quelques Maladies Orues de la Bouche Malheureuse*, &c., p. 18, 8vo, Paris, 1831.)

In this work M. Genoul states, that several years previously he had known patients die of very tedious operations undertaken for the removal of cancerous and other tumours of the atrium. Reflecting on the fate of these unfortunate individuals, he was led to conclude that others labouring under similar diseases might be cured by an operation which consisted in freely dividing the atrium and upper jaw-bone, so as to be able to divide the osseous parts instead of meddling with the diseased mass, and of searching for the precise limits of the disease in the midst of blood and the remains of the affected textures. In short, he was induced to think that the same principle should be acted upon in this operation as is followed in others undertaken for the extirpation of cancerous tumours in general.

If the face of the skeleton be examined, it will be seen that the upper maxillary bone is fixed to the others only at three principal points: 1. By means of its nasal process, and at its connection with the os trigonum and ethmoid bone. 2. By means of the alveolar process of the maxilla bone as far as the alveolo-maxillary foramen. 3. By means of the connection of the upper jaw-bone to the fellow, and to the palate bone. There is, indeed, a point of contact behind with the pyriform process and palate bone; but this point gives way on depressing the upper jaw-bone to waste the mouth. In attacking these difficult points, no large vessel is injured, the trunk of the internal maxillary artery generally escapes, and, if wounded, may be readily tied, as was exemplified in the removal of the whole of the upper maxillary bone, performed by Mr. Lister at the North London Hospital on the 27th February, 1836. If the hæmorrhage during the oper-

sion were to be greater than calculated upon, the carotid artery might be compressed against the transverse processes of the cervical vertebrae. As for nerves, the only one of consequence necessarily divided is the superior maxillary; but it may be easily cut through before the bone is displaced, and then the laceration is healed, if judged advisable. This proceeding is strongly advocated by M. Gosselin; but in the operations which I have seen performed, no preliminary division of the trunk of this nerve was practised, yet no ill consequences were the result.

The patient should be seated in a chair, with his head inclined backward, and supported on the breast of an assistant. One of the incision teeth is to be extracted at the place where the division of the bone is to be effected below. An incision is now to be made from the inner canthus of the eye down to the upper lip, which is to be cut through opposite the canine tooth; and the incision may then be made from a point five or six lines to the outer side of the external angle of the eye down to the termination of the fist. This will leave the parotid duct safe below it. The flap is next to be raised up as far as the lower border of the orbit. This plan is more simple and less disgusting than that of M. Gosselin, who, after the first incision has been made, makes a second from the level of the nostril to a point about four lines in front of the base of the ear; and then a third, extending from a point five or six lines behind the external angular process of the orbit down till it meets the termination of the second cut. The quadrilateral flap thus formed is then reflected on the forehead. M. Velpeau prefers no incision commencing at the commissure of the lips, and carried outward, and then upward towards the temporal fossa. This would not, however, expose the bone sufficiently for the section of its nasal process, for which purpose the perpendicular cut, from the inner canthus down to the upper lip, is very necessary. When the incision is large, the circular sweep of the knife, as advised by M. Velpeau, and long ago practised by surgeons in this country, has advantages. The bone having been denuded, the next step is to divide the connexion of the malar bone with the external angular process of the frontal, and immediately afterward the zygomatic process of the malar bone. These excisions are best accomplished with Liston's cutting forceps, which should have long powerful handles, a connexion fixed in the North London Hospital to answer better than jointed handles, which cannot be opened so wide, and have a tendency to slip off the bone instead of cutting it. The greater power with which they shut does not, therefore, seem to Mr. Liston to compensate for the inconvenience referred to. At all events, any additional power required can be obtained by simply lengthening the handles.

The next thing is to divide the nasal process of the superior maxillary bone, and the connexion of the latter bone with the os unguis and os planum. For this purpose, one blade of the forceps is put within the orbit, the other within the nose, and the section accomplished.

This having been effected, and a cut made under the lower part of the palaty, the upper jaw bone is divided with the same instrument at the place where the incisor tooth was extracted, together with the palatine process and palatobone at the symphysis.

The bone being next pressed downward, the slight connexion with the pterygoid process

through the antrum of the palate-bone given way, when the upper jaw-bone, including the whole of the antrum and disease occupying it, is easily dissected out. The flap is brought down, and the wounds united with the twisted suture, aided with narrow strips of adhesive plaster. Mr. Liston prefers, as less irritating, strips of silk smeared with a solution of ergoline in brandy. These strips he does not usually remove till the wound is healed. The straight steel needles which he employs for the twisted suture, and the eye-nails of which are tipped with red sealing-wax, and the points cut off with glass directly after their introduction, are removed within the first forty-eight hours, leaving the many-twisted silk to come away as soon as it loosens.

The following is Mr. Liston's description of the operation: To expose the bone, the cheek is divided from the angle of the mouth to the origin of the nose, and a second incision made from the inner canthus to the edge of the upper lip, near the nasal line, detaching the skin of the nose from the maxillary bone. The flap of the cheek thus formed is dissected up, and the nasal process of the maxillary bone and the body of the os maxila are divided with a saw or with strong cutting pliers. An incision having been made through the covering of the hard palate, near the nasal line, a small converging saw is applied to the bone, and the alveolar process is cut through with the glass, after extraction of the middle and lateral incisors. The bone is then rolled downward and forward, and its remaining adhesions severed by means of the lancet or pliers. During the progress of the operation, the six branches of the facial and temporal arteries are interrupted by ligature or pressure, and the violence of the hemorrhage is moderated by pressure on the carotids. After removal of the bone, the deep vessels, branches of the internal maxillary, are secured either by ligature, or by firm pressure with clamps or dooms of lint. The facial flap is retracted, brought together over the clamps, by which the cavity is filled, and united by interrupted or continuous suture. (See Liston's *Essay*, part ii, p. 158.)

In the examples of this operation which I have seen, any preliminary ligature of the common carotid artery would have been totally unnecessary. In one instance the internal maxillary was cut, but secured with the greatest facility. In a case operated upon by Mr. Liston in the North London Hospital, not a single ligature was necessary.

It is an important object to prevent, as much as possible, the blood from flowing towards the throat in the early part of the operation; hence the advantage of the sitting posture, and of Gosselin's plan of beginning with the division of the cheek-bone of the nose, before the nasal process of the upper jaw-bone itself is attacked.

RESECTION OF LOWER JAW-BONE.

The practicability of this operation was long ago evident enough, from cases in which the greater part of the bone had been torn away by gunshot injuries, or where it had exfoliated from necrosis. Borel relates an instance in which it was taken away by machinery, and Wepfer quotes a case where it was amputated in his time. Mr. Anthony White, surgeon to the Westminster Hospital, removed a considerable portion of the bone for an osteo-doma many years ago. Unfortunately, the case was not pub-

ished, so that the revival and execution of the operation are generally referred to Dupuytren, who in 1812 performed his earliest extension of the body of the lower jaw-bone. The parts removed weighed a pound and a half; the bone was affected with exostoses, caries, and necrosis, situated in several places, and covered with a hard fibrous crust. The patient recovered, and was in perfect health twenty-one years after the operation. (*Dupuytren, Clin. Chir.*, t. iv., p. 628.)

Subsequently to the year 1812, the operation has been frequently repeated by Dupuytren, Dr. Mott, Richardson, Lallemand, Delpech, Roux, Courch, Martin, Geely, Magnan, Cloquet, Wainman, Lichane, Warren, Gossard, Gräfe, Wallner, Wagner, Ranselöph, Liston, Lawrence, P. Crumpton, Velpeau, &c. By McClellan, Walker, and Gräfe, nearly the whole of the bone has been taken away. In many other operators, disarticulation has been performed at one of the condyles. (See *Cham. in Dublin Hospital Reports*, vol. iv., p. 13; *Lancet's Flou.*, part ii., &c.)

The method of performing the operation varies according to the extent of the disease. To expose the tumour, and allow the body to be readily divided, there must necessarily be a free division of the soft parts. Previously, also, to exposing upon the plan of operation, the extent of the disease must be correctly ascertained. (See *Gossard's Flou.*, part ii., p. 224.) When only the central portion of the body of the bone was to be removed, the following was Dupuytren's plan: the patient is seated, and his head held steady against the breast of an assistant, who is to stand behind him, and, if necessary, make pressure on the facial arteries. The surgeon, standing in front of the patient and on his right side, is to take hold of the right portion of the lower jaw with his left hand, while an assistant takes hold of the left portion. In this way the jaw is rendered tense, and separated from the other. With a common scalpel an incision is then made completely through it, from above downward to the base of the jaw. The next thing is to extend the wound through the skin and cellular tissue from this point down to the prominence of the os hyoides. These two flaps are produced, each of which is to be dissected up as far as the extent of the disease requires, while the knife kept close to the bone, so that the facial arteries may not be wounded. The exact places having been ascertained to which the saw is to be applied, a notch on each side must be extracted. The operator then taking a fine malleocephal saw, or one of Hey's, goes behind the patient, in which position the saw can be employed without any risk of its extremity being pushed against the palate. It requires, the lower and upper lip may be protruded within piece of pasteboard. But, according to my observations, the best plan is only to make a groove, or partial division of the bone with the saw, and then to complete the section on each side with the riving pliers, which expedite the business very considerably, and with no risk of injury to the contiguous parts. The bone having been cut through on each side, the surgeon takes hold of the portion about to be removed with his left hand, and, while it is retained forward, he introduces a straight bistoury from below upward close behind it, and detaches it from the soft parts to the right and left, keeping the edge close to the bone. An assistant takes care to keep the bistoury on the way with a spatula or the handle of a director. The vessels are now secured, the ends

of the bone approximated to one another, and the flaps of skin united with sutures; care being taken to leave a small portion of the wound open below for the insertion of a bit of charcoal, and as an outlet for the discharge at the time of matter being formed.

If the portion of bone to be taken away was so extensive as to require the removal of a part of the integuments, Dupuytren made two incisions, one in each side of the lip, which were extended down so as to meet the os hyoides, and from together rose in the shape of a V. When a perpendicular cut will not suffice, an extension of the extent of the disease, it may be converted into a cruciate wound by making an incision along the base of the jaw.

One danger attending this operation is the retroversion of the tongue into the pharynx as soon as the attachments of the genio-gloss muscles behind the symphysis have been cut. In this state the tongue presses the epiglottis against the glottis, and the patient is in imminent peril of suffocation. Indeed, in one case, M. Lallemand would have lost his patient had he not instantly performed tracheotomy. Hence Delpech, before he divided the muscular connections of the tongue behind the symphysis, used to secure the extremity with a elastic bandage, which was then intrusted to an assistant, and afterwards, in applying the scissors, he passed the thumb of one of them through the median of the finger and the skin together; if the interrupted suture were employed, an assisting the tracheal suture to be performed, the ends of the thread, passed through the incision, were twisted around the pins. In one case Delpech introduced a piece of gold wire through the apex of the scissor, and fastened it to the cutaneous teeth. The wire soon cut its way out, leaving a sufficient adhesion. In few instances, the circumstances of the disease may be such as to make it necessary to remove only a portion of the depth of the bone.

As the retroversion of the tongue, though not constant, is always a possible event, I consent with Malgaigne (*Mé. de Méd. Oper.*, p. 259) in the preference of extending to the skin directed on this subject by Delpech, of close taking care not to cut through the tendons of the genio-gloss muscles until the possible displacement of the tongue has been guarded against.

In the extension of the whole of the horizontal portion of the lower jaw-bone, one plan consists in making an incision along its base, and extending it a line or two beyond its angles. A large flap is thus dissected up, and turned over the face. The bone is sawn on each side beyond the limits of the disease, and then detached from the soft parts which are connected with it behind with the precautions, and according to the direction above particularized.

If the disease were to extend high up in the right, an incision should be made along the posterior edge of each ramus so as to meet the extremities of the first wound.

Another method, described by M. Malgaigne, is easier than the foregoing. After the horizontal incision has been made, a perpendicular one is made completely through the lower lip, and carried down to the middle line till it meets the horizontal wound. Both the lateral flaps are then dissected up.

In the extension of one half of the horizontal portion several methods are adopted. In one, performed by several British surgeons, and also by J.

Chopart, a horizontal incision is begun at the commissure of the lip, and terminates at the distance of one or two lines beyond the angle of the jaw. To this first incision are added two vertical ones: one descending from the border of the lip to the base of the bone; the other, taking a parallel course, descends behind the massa to a point a few lines below the angle. The flap is dissected from above downward; the soft parts are most detached from the inner surface of the jaw, and, lastly, the bone is sawn through. In the latter proceeding I particularly recommend Hey's saw, or a small rectangular one, forming a groove in the bone, which can then be divided with the cutting plane at one stroke, as practiced by Mr. Liston, and always demonstrated by me in the Lectures on Operations at the London University.

Mr. Liston has likewise expressed himself as follows in favour of one method, in which the flap is made from above downward: "The cheek may be divided (says he) by passing through it a large narrow bistoury close to the anterior edge of the masseter muscle, and carrying the instrument forward, and through at the angle of the mouth. From each extremity of this incision another is made downward, the anterior one inclining forward, the other backward. By refection of the flap thus formed, the bone is exposed more easily, rapidly, and perfectly than by the former mode of incision, in which the flap is made by a semicircular incision along the base of the jaw." (*See Liston's Elem.*, part II., p. 224.)

In the plan adopted by Dr. Moir, at New-York, two flaps are formed. A curved incision is made, with its convexity downward, from a point in front of the ear, and on a level with the cyclops, to the trinity of the chin below the commissure of the lip. The upper flap is raised and reflected on the face. A second incision, descending from the upper end of the first to the angle of the jaw, enables the surgeon to form a lower flap. The bone is sawn through, first in front, and then behind, as high up as the circumstances of the case require. If above a certain point, Dr. Moir recommends the inferior maxillary nerve to be cut through before the bone is drawn outward, and the lingual branch of the fifth pair to be carefully avoided.

A third method, which has the names of Cusack, Liston, Liston, Malgaigne, &c., in its favour, consists in making, first, a vertical incision through the lip down to a point below the chin, and then a horizontal cut, extending from the first along the base of the jaw to two lines beyond its angle. The flap is then dissected off the hardest, in the direction from below upward, and reflected on the face. The bone is then sawn through in front and behind, and the flap united with sutures. I am of opinion with M. Malgaigne, that this plan is more simple than the others; no ligament of any value is likely to follow it, and the scar will produce but slight disfigurement. I recommend, however, the front portion of the bone to be divided before the posterior part of it, so facilitating the safe detachment of the mylohyoid and other parts connected with its inner surface.

One method, described by Mr. Liston, is a modification of the foregoing: "If the tumour is included between the lateral maxillary tooth and last molar, in the same side these teeth must be extracted to permit division at these points. A semicircular incision may then be made along the base of the jaw, the bases of the incision pointing up-

ward, and passing over the spaces which were occupied by the extracted teeth. The flap is dissected up, and the membrane of the cheek divided along the line of the incision. The bistoury is then carried along the inside of the bone, so as to divide the membrane of the mouth, and separate the attachments of the muscles. The tongue is pushed aside, and a copper spoon placed under the jaw at the part to be divided, in order that the soft parts may not be injured during the sawing. A small narrow saw, or one commonly known by the name of Hey's, is applied to the bone at the points where the teeth were extracted, and by a few motions of this instrument a notch is made of no great depth; a pair of strong pulling-pliers are placed in the track, and by their division of the bone is accomplished with great ease and much more rapidly than if the use of the saw had been continued. The pliers should be strong in every point, and the handles long, to afford the advantage of a powerful lever." The chin-ear, he says, is not to be depended upon, and is shown in its operation. (*See Liston's Elem.*, part II., p. 224.)

A fourth plan, described by M. Malgaigne, may be applicable where the disease extends more in the direction backward than forward. In such a case, perhaps, it may be sufficient to make a semicircular incision along the posterior border of the ramus and the base of the bone, from the ear to the chin. Thus only one flap would be formed, and no excision would be made on the face.

M. Malgaigne says it down as a maxim, that, in making the flaps in any of these operations, the skin and cutaneous tissues should alone be divided; and that the remainder should be cut through, and removed at the same height as the bone itself.

The facial artery is readily secured. All those operators who have had recourse to the ligation of the carotid artery as a preliminary measure, have subjected their patients to a very needless proceeding.

Even in the course of per half the lower jaw, as its articulation with the temporal bone, the ligation of the carotid artery is quite uncalled for. Our plan consists in making an incision along the base of the jaw; a second cut is then made perpendicularly through the lower lip down to the first; and a third begins at the epiglottis, and extends behind the ramus. The flap is raised, and the free part of the bone sawn through. The soft parts are then detached from its inner surface, and the tendinous attachment of the temporal muscle to the coronoid process cut through from within outward. Lastly, the disarticulation of the condyle is effected: for this purpose, the external lateral ligament should first be divided; and, while the bone is depressed and twisted, in order to render the capsular ligament tense, the lower part may either be cut through with scissors, as recommended by M. Malgaigne, and then the corresponding history used, or it may be divided at once, together with the external pterygoid muscle, by means of the probe-pointed bistoury kept close to the highest part of the inner side of the condyle, so as to leave the inferior maxillary artery safe on the inner side of the neck of the bone. A green end of the safety of this operation will depend upon the edge of the knife being kept close to the inner surface of the bone, so that the ligament branch of the fifth nerve may be left unimpaired, and, upon attention being paid to the directions given for the disarticulation.

tion, which, after the insertion of the temporal muscle has been divided, is greatly facilitated by depressing the anterior part of the bone forcibly, and twisting the condyle inward. The fracture will be chiefly from the facial, dental, and branches of the temporal and internal maxillary arteries.

Instead of making the flap exactly in the manner above described, I prefer making, first, the anterior perpendicular incision, and then another, beginning a little way in front of the lobe of the ear, extending down along the posterior border of the tragus, and then forward along the tip of the base till it meets the lower termination of the first wound. This is most simple, and enables the surgeon to get more readily at the external lateral ligament.

In the terrific operation of extirpating the whole of the lower jaw-bone, the incision should extend from a point a few lines in front of the lobe of one ear, down the posterior edge of the tragus along the whole base, then one angle to the other, and then up to a point a few lines in front of the lobe of the other ear. Care having been taken to prevent introduction of the tongue, and the front portion of the flap raised, the soft parts behind the symphysis should be cut, and the bone saved in this situation. Then the use of the vast flap is to be raised on each side, and each half of the bone to be removed according to the foregoing directions.

BONES, PATHOLOGY OF.

As a living texture, that of the bones is subject to many of the diseases which affect other parts endowed with vitality, and in which the functions of circulation, assimilation, absorption, and nutrition are essentially going on. Thus it is liable to atrophy, hypertrophy, inflammation, suppuration, a change resembling tubercles, and another like modification of other parts. The nerves, it is said, have never been demonstrated in the osseous texture; yet, if it be the end of pain, our judgment must infer the existence of what may not be discernible by the eye. M. Sanson very aptly compares the organization of bone to something between that of an organic and that of an inorganic body, its vitality being necessarily obscure, and corresponding to its constituent elements. The organic actions, when implied, to be carried on in it with greater difficulty, the more the earthy matter in it predominates over the animal part. Thus, in children, irritation, inflammation, and every action in the osseous texture are quicker than in old persons, because the bones in early life contain a greater proportion of animal matter than at a later period, when the phosphate of lime is more abundant. However, even in children, and still more conspicuously in adults and old persons, the diseases of the bones are generally marked by a slowness of character which has attracted the notice of all pathologists. Many weeks are required for the completion of a provisional callus, and months a twelvemonth for that of a definite one; while a few days, and often a few hours, will suffice for the union of the wound of the soft parts. In consequence, also, of the inferior, or inconsiderable extension of the bones with the nervous system, they frequently appear to inflame and undergo disease, without involving the rest of the system in any sympathetic disturbance, till the irritative is propagated to the surrounding parts, or suppuration comes on. As M. Sanson observes, a necessary consequence of

this fact is, that therapeutic means, even those of the most energetic kind, frequently have but little power over affections of the osseous tissue, and if they prove effectual, it is not till after a long perseverance with them. (See *Sanson's Diss. de Med. et de Chir. Phys.*, t. XII, p. 308.) See ANKYLOSIS, CARIES, CARIES, ENOSTOMA, ENOSTOMA, JOINTS, MALIGNANT, NOSTOMA, OSTEO-SARCOMA, OSTIUM, PLEURISITIS, RHEUMATISM, SCURVY, STYRIA, TUBERCLES, TUBERCULAR DISEASE, AND VITRIFICATION.—C.]

BRONCE, ATROPHY OF. One of the forms of Atrophy of Bone, by Thomas Robert Bell. Local atrophy is generally the result of pressure or friction, as experienced in the effects of tumours and other tumours on the skin, and in the change taking place in the size and shape of the head of the maloccluded humerus, if not is altered. Of such alterations there are some excellent specimens in the University College Museum. Mr. Curling notices also the local atrophy of bone from mechanical injury, and refers to the two thigh-bones figured by Cheselden in his *Anatomical Tables*, taken from the body of a soldier who had been shot in the right groin, and died soon afterwards of dropsy. The right femur is mentioned as much wasted, and to have been less than half the weight of the other.

The author likewise alludes to the atrophy of bones consequent to a suspension of their functions, and to that induced by deprivation of the nervous influence, as sometimes attended in cases of injury of the spinal chord. Mr. Curling adduces instances of these facts, and refers to a case recorded by Mr. Travers, in which the union of a fractured leg, that was paralyzed from a fracture of the lumbar vertebra, failed to proceed, while a broken humerus in the same subject united perfectly in the usual period. (*On Constitutional Lesions*, vol. II, p. 436.)

Although the fracture of the femoral artery is a fracture of the leg complicated with hemorrhage is well known not to interfere with the nutrition of the bone or the union of the fracture (see *Fractures and Trauma*, p. 500, vol. II) appears from Mr. Curling's investigations that, if the supply of blood to a bone by its natural artery be obstructed, a species of atrophy will come. Thus, in the thigh-bone, if fracture below the entrance of this artery, the walls of the portion of such bone below that point will be found thinned, and the cancelli expanded, such changes, however, is not observed in bones recently fractured, nor in those long united, nor in bones fractured during the period of growth. Mr. Curling correlates with some interesting examples on fractures of the neck of the femur. (See *Med. Chir. Trans.*, vol. XXI.—C.)

BRONCHOCELE. Scarpa believed that the thyroid gland was never primarily affected with true scirrhus, maintaining that the disease was always consecutive to cancer, or scirrhus of the lungs, oesophagus, parathyroid or sublingual gland. Dr. Sæverus relates a case, however, proving that on this point Scarpa was incorrect; and he also details an instance of fibrous hematomas of the thyroid gland. Of this last disease there are at least two specimens in the Museum of University College.

Besides the form of goitre already named, there is another, sometimes termed *acromioid*, and consisting of an extraordinary development of the thyroid arteries and their branches. Every point of the tumour has a strong pulsation, not, however, like that of an aneurism, but giving a

operation and the blood was flowing very rapidly into numerous vessels, with an obscure hissing noise or rattling murmur, which is most distinct over the thyroid trunks. I think a case of this description was once shown to me by Mr. Fisher. In two cases recorded by Dr. Sarsin, the tumours had existed many years, and began during the efforts of parturition.

Notwithstanding the numerous cures of bronchitis accomplished by means of iodine, the plan fails in many instances. As Dupuytren observes, the disease depends on different causes sometimes it is a simple hypertrophy, sometimes a scirrhous degeneration; and on other occasions it is composed of cysts filled with matter of differing kinds. Iodine cannot however equally be so many affections of diverse character. (*Chronic Obs.* t. iv. p. 467.) According to Dr. Stiebel, iodine is chiefly useful in the hypertrophic and scirrhous forms; less so in the lym-

phatic; and perfectly ineffectual against small, isolated, solid nodules. The best mode of using iodine seems to Dr. Sarsin to be friction, with an ointment of hyaloidine of potato, continued from time to several months.

When a tumor was passed through the thyroid gland, Dupuytren already noticed a copious discharge of venous blood; but he found it soon stop on securing the patient to make full inspirations, and applying cold water and moderate pressure. (*See Chronic Obs.* t. iv. p. 470.) Dupuytren would not have the tumor looked upon as capable of causing every bronchitis. Of course, it will produce no fundamental change in the scirrhous degeneration of the thyroid gland; but, in cases of hypertrophy, cysts, and hydatids, where iodine and other specifics frequently fail, the disease will be more likely to yield to the action. (*Ibid.* p. 471.)—C.]

C.

[CÆSAREAN SECTION. According to Bayle, August Cæsar's mother, was lying at the period when that source decided Spring, so that, if he were taken out of the womb by this proceeding, the life of the mother was saved. Although the etymology and free practice of the Cæsar operation are points involved in controversy, its great antiquity is generally admitted. Mr. Cæsar has lately adverted to some recent instances in which the Cæsar operation was performed "in a majority of the instances which may demand it: he across pelvis, tumours in the uterus or vagina, extra uterine conception, rupture of the uterus, and sudden death from apoplexy and other causes. The operation (says he) has also been performed, and with success, in the leading countries of the world. In England we have a single and most critical example of its success by Mr. Knowles, of Birmingham; and in America, Professor Gibson has been the first to save the life of both patient and child by this intrepid proceeding. The most frequent examples are to be found in the publications of France and Germany; and I have grounds for stating that on some occasions the operation has been resorted to where there seemed to be danger by a hope of any good result, or determined on when not absolutely called for, or performed and more often where obviously applicable, not only because calculated to avoid protracted suffering, but to afford a chance of saving life. Bayle in the æternæ ariston calls for ventro-section, Among the numerous cases of this accident, no less than thirty-five, related by Dr. Collins, there is scarcely one in which the operation could have been undertaken with propriety. The recovery of two patients after rupture of the uterus in Dr. Collins's practice, and under the most unfavourable conditions, should inspire the less anxious of the departing on the occurrence of so formidable an accident." (*See J. G. Owen in Pract. Med. and Surg. Trans.* vol. v.)

From a statement made by Blandineau, it appears that the Cæsar operation had been performed twenty-four times with success between the year 1750 and the beginning of the present century; and according to M. Velpeau, even without including Lapeyrol's cases, which

are acceptable, it has also been practised with a favourable result twice at Nantes, by Baccin, on the same woman; once at Aix, by M. Le Masson; once by M. Ponsard, at Marseilles; once at Delfin, by Vonderfuer, in 1823; once in May, 1825, in the Hospital of Florence; twice by Schæffer; once by Hipp; once by Græfe; once by Burns; and more more, quite recently, in the colonies. Let not practitioners, however, underrate the true danger of the operation; for, as M. Velpeau justly observes, no doubt every successful case has been brought before the public, while many unsuccessful ones have been kept out of view. His belief is, that at least half of the operations here had a fatal termination. (*See Nouv. Élév. de Méd. Opér.* t. iii. p. 677.)

Rich, a surgeon in Upper Silesia, performed the Cæsar operation successfully in a case of extra-uterine pregnancy of some years standing, during which period the woman became pregnant in the ordinary way, and was safely delivered. (*See Græfe and Walther's Journ.* part vi., vol. vi.) The particulars, which are well deserving of the attention of obstetric practitioners, may also be found in one of our own periodicals. (*See Edinb. Med. and Surg. Journ.* vol. xliii. p. 429.)—C.]

[CÆSAREAN OPERATION.

When the former edition of this Dictionary was published, it was correctly stated that in England the operation had never been successful, though it had been performed thirty times. The only instance of its performance in America at that period was the case reported by Dr. Richmond, of Newforn, Ohio, in which the mother was saved. Since then, however, Professor Gibson has been the instrument of conferring celestial favour upon American surgery by the successful performance of this splendid operation, and repeating it about two and a half years afterward upon the same patient, and in both instances he has completed his triumph by saving both mother and child, a result which has never been attained before in the United States. Indeed, there is not a single instance of a similar result in Great Britain, and that by Mr. Knowles, of Birmingham, recently reported.

The circumstances of this intrepid proceeding

of Professor Gibson, which is an honour to his surgical science and skill, together with the history of each operation and its results, will be found supplied with great particularity in his late edition of the *Lectures on Surgery*. For the purpose of discriminating this operation from gemmation, which is sometimes necessary for removing an extra-uterine foetus, he demonstrates it hysterotomy, or Cæsarean section. The extraordinary interest which these operations possess in themselves, especially in view of their being performed upon the same woman, and often crowned with complete success, entitle them to a place here.

The lady who was the subject of these operations was found, on her first labour, to have a deformed pelvis, the antero-posterior diameter not exceeding two inches. The constitution stimulated in the case was swayed by the adverse judgment of Dr. Physick, and other distinguished surgeons, which was adverse to the Cæsarean section; and it was decided to remove the child by epiotomy, which was accomplished by Dr. Meigs. This was in May, 1831; and in June, 1832, it became necessary for the same gentleman to repeat this operation for the removal of a second child, it being, of course, impossible to deliver per vias naturales, and the patient at the time refusing to submit to the Cæsarean section, though advised thereof.

In 1834 this lady became pregnant with her third child, and by the justifiable advice of her physician, Dr. Natchez, she consented to risk her own life in the hope of saving that of her offspring. On the 25th of March, 1834, her labour commenced; and, after the os uteri had dilated sufficiently to admit two or three fingers, the membranes containing water, Professor Gibson commenced the operation, in the presence of numerous professional friends, by making an incision from below the umbilicus nearly to the pubes, the skin being lifted up and held between the fingers of an assistant, and the back of the knife being towards the abdomen. The superficial fascia, the contents of the abdominal cavity, and the peritoneum being successively divided before cutting completely through the wall of the uterus, an unsuccessful attempt was made to rupture the membranes per vagina, on the failure of which the remaining fibres of the uterus were divided, and the membranes instantly opened by turning Cooper's trepan; the protruded hernia upward and downward the whole extent of the incision in the uterus, which measured six inches, the sides of the wound being held closely together, both to prevent protrusion of the intestines, and the escape of any portion of the waters into the bag of the peritoneum.

The position of the child was found to be the third breech presentation of Baudouin. The child was then removed by the feet, which was slowly performed, and proved to be a female of large size and healthy appearance. After suitable restorative, she breathed, and the cord being cut, the child lived. The placenta and membranes were then removed, and a finger passed from the cavity of the uterus through the dehiscence into the vagina. A slight protrusion of intestine occurred, but was soon restored; no fluid was permitted to enter the peritoneal sac, nor did any considerable hæmorrhage occur, so that no ligature was called for. The womb began to contract, and in a few seconds the extent of the incision had nearly contracted. The edges of the peritoneum, uterus, and integuments being

brought carefully together, three stout silk sutures were passed through the deep-seated sides of the interrupted line, an inch and a half apart, and with adhesive straps, a compress, and rube, the dressing was completed, the lower angle of the wound being left open to facilitate the discharges which might occur. The placenta being removed from the table to her bed with great care, was placed on her back, the uterus kept exposed, and she soon slept for several hours. No unpowered symptoms occurred, and on the 25th day the patient was able to sit up, the wound having healed kindly, and coagulation being nearly complete, and soon after was returned to her domestic household. The child was named Maria Casostema, and continues to thrive.

On the 6th of November, 1837, *Permetia* (this son was called to repeat this unusual proceeding on the same patient, she being in labour with her fourth child.) The different steps in the operation were nearly the same as in the former instance; and, although her recovery was slow, yet within three months she nearly recovered, the wound throughout having freely contracted. This child was found to be a male, and named Cesar Augustus. At his age (five years, 24th, 1843), this mother and her two children were in excellent health. The lady has not since become pregnant.

Professor Gibson has since confined upon himself, as well as upon American surgery, a number of which both may be found, among which Dr. Cooper has suitably noticed in his late edition. He accompanies it, however, with the acknowledgment of Mr. Knapp's case at Philadelphia, which met with success, and which was rendered necessary by a pelvic deformity requiring a similar resort.

Professor Gibson gives the following indications of the conditions and contraindications which it may become necessary to know the purposes of the abdomen, divide the peritoneum, and cut into the womb as in this operation: "Extraordinary distension of the uterus; of the ovaries and other viscera within its cavity; fissures of the instruments and vessels to be used by irregularity of course, or profusion of bleeding; of distensions of one or both thighs; of wounds of the uterus; of extraordinary size of the fetal viscera; of fetal immaturity; of lesions of the uterus; of preterm labour; of rupture of the uterus; of rupture of the ovary; of dissection of the uterus; of large tumor in the bladder; of strictures and obstructions in the vagina; of enlargement of os uteri; of extra-uterine conceptions; and other diseases, accidents, or malformations, or death of the mother." Happily, most of these emergencies rarely occur, and the propriety of the operation is often alone very questionable. So imperative a step should never be taken without grave deliberation and full consideration, and the difference should be well probably after surgeons have undertaken it, except when its necessity is decided on as called for in full view of all its dangers. In such a case, however, Dr. Gibson's caution will be courage + resolution when, as in his case, the duty of the surgeon becomes imperative.

We should never forget, however, that there have been cases in which the operation has been determined on, and yet, while the proceedings were making, the child has been born per vias naturales. And, moreover, women who have suffered the Cæsarean section as a parturient labour, and in one instance a repetition of a first

times, have nevertheless been delivered without it in a subsequent attachment.

It has been suggested whether, in cases of hopeless debility of the pelvis, the *Phlegon* tubes might not be devised in the progress of the Cancerous action, for the purpose of preventing the risk of a repetition of this inevitable operation. It would not increase the danger of the first, and would infallibly protect the patient from the hazard to life by a second place of the operation. With the consent of the patient and her husband, after explanation of its effect, there does not appear to be any moral or professional objection to adopting it. Such intelligent consent of the parties ought in all such cases to be granted, unless imperative in one sex to sterility, in the other as to be the result of surgery.

In the *Amer. Journ. of Med. Sciences* for 1855, Dr. Joseph G. Naamode, of Philadelphia, reports the last of Dr. Gibson's operations, which, indeed, was undertaken at his instance, accompanied by an elaborate and able paper on the general subject, to which the reader is referred for details and references of an critically practical character.

Dr. Valentine Mott, of New-York, has opened the abdomen for the removal of an enormous testis, which had been borne for one year and eleven months. The case was an unfortunate one, and terminated fatally.

Dr. Hoffman, of New-York, reports a case of Cancerous action performed by him on the person of a dwarfed forty-two years of age, who was in labor with her first child, and whose pelvis was as much contracted as to render embryotomy imperative. The case terminated favorably for the mother, but the child, which was also safely delivered, did not long survive its delivery. The case is reported at length in the *N. Y. Med. and Surg. Journ.* for 1859.—[Review.]

(CANCER.) Although the terms *cancer* and *carcinoma*, considered with reference to their etymology, seem distinctly to possess little commonization, the makers employ them with a far more precise and settled meaning than the ancient medicalists as they were by pathological analogy. Still our knowledge of cancer is not even now sufficiently advanced to enable us to answer conclusively various questions respecting it.—(See *Bégin in Dict. de Méd. et de Chir. Pratiques*, t. iv., p. 425.)

Frequently, a vast number of morbid alterations of structure, entirely different from one another, were denominated together under the name of cancer. The French academy to Laennec the merit of having first demonstrated the elementary texture of transudation, and thus freed the subject from a great deal of confusion. I believe, however, that Hume, Baillie, Hey, and Abernethy had all pointed out their observations on cancer when Laennec published. According to the latter distinguished pathologist, the human body is liable to two classes of accidental productions or new formations; to the first belong certain abnormal textures, to which some of the natural tissues are more or less analogous; in the second appertain other abnormal textures, which have nothing analogous to them in any of the primitive tissues of the body. Among the productions of the latter kind, Laennec arranged *adenoma*, *scirrhos*, the *encapsulated*, *carcinoma*, or (as we more frequently call it) the *solidary tumor*, and *melanoma*. Notwithstanding all or several of these abnormal elementary modifications of tissue may yet exist in tumors, various-

ly called *cancers*, yet, as M. Bégin well observes, and M. Laennec admits it himself, it is particularly to *scirrhos* and *carcinoma*, or *solidary formations*, that the term *cancer* is applied. In this article I shall confine my considerations to *scirrhos*, which French pathologists never regard as *cancerous*, but generally as a form of *scirrhous disease*. Neither shall I enter, at present, into the subject of *melanoma*, which, though sometimes regarded as a species of cancer, as he observes, by M. Alibert, who limits it *cancer vellosus* (*Ann. Medico-Chir.*, t. i., 1817, 406), will admit very advantageously of separate consideration. (See *Melanoma*.) According to Professor Carcass, expressing there not only of a precise definition, but it may be said to consist in the formation or deposition of a precise substance, which presents great variety of consistence, form, and colour; frequently assumes a definite arrangement, and possesses a peculiar organization of its own; gives rise to the gradual destruction or transformation of the tissue in which it is situated; affects successively or successively a greater or lesser number of organs; and has a remarkable reproductive tendency. Both *scirrhos* and *solidary cancer* have long been looked upon as *solidary diseases*, though not with that determination and precision of meaning which the valuable remarks of Mr. Treves are likely to establish. This cautious speaker circumscribes in a point of the order "malignant diseases," and agrees with Laennec, Carcass, and other eminent modern pathologists in estimating two species of it, the *scirrhos* and the *solidary*. It is to incalculable loss to man (not local, and consequently, the disposition to appear in one part at the same time, or to reappear when the first affected part has been freely removed, that Mr. Treves applies the term *malignant*. But it, from any local cause, a sore will not heal, or becomes gangrenous; if by the extension of the ulcerative process, bloodvessels are closed, and fatal hemorrhage ensues; if, by the production of a fistula, the patient dies exhausted; if, by the incessant irritation of the nervous system, or the morbid actions set up in vital organs under a protracted symptomatic fever, life is extinguished, the circumstances of the disease, viewed with reference to the above definition of malignancy, would not imply that its nature was malignant. (See *Med. Chir. Trans.*, vol. xv., p. 108.)

Dr. Carcass forms the essential character of heterologous formations, of which *scirrhos* and *solidary cancer* are examples, on the presence of a substance which does not enter into the healthy composition of the body, and under the generic term of *carcinoma* he comprehends *scirrhos* (*scirrhos*) and *solidary cancer* (*solidary*), with their varieties. His reasons for arranging these diseases together are the following: 1. They often present, in the early period of their formation, certain characters common to all of them, however much they may differ from each other in the subsequent periods. 2. They all terminate in the gradual destruction or transformation of the tissues which they affect. 3. They have all a tendency to affect several organs in the same individual. 4. They all possess, though in various degrees, the same reproductive character. (See *Carcass's Illustrations of the Elements of Diseases*, fasc. 2.)

But, though the varieties of *scirrhos* and *solidary*, as they are named by Dr. Carcass, resemble one another in the foregoing respects,

they present differences with this pathologist refers to two scales of the heterologous deposits, to which they owe their origin. In *scirrhus*, the deposit has little or no tendency to become organized. Its form and arrangement appear to be determined chiefly by external circumstances, and its production and increase are not directly dependent upon the nutritive function of the organ in which it is situated. In *epithelioma*, the deposit has a greater or lesser tendency to become organized; and, "although it may at first assume a determinate form and arrangement in consequence of external circumstances, it possesses in itself properties, by means of which its subsequent arrangement and development are effected, independent of the nutritive function of the organ in which it is formed, except in so far as the materials of its growth may be derived from this source." (See *Cancer*, p. 41, c.)

With respect to the varieties of *scirrhus*, when the heterologous deposit is collected in numerous points in the form of a hard, pure, serous-looking substance, intersected by a dull white or pale straw-colored trabeculae or confluent cellular tissue, it is designated *scirrhus*. When it assumes a regularly localized arrangement, so as to represent an appearance similar to a section of the pancreas, it forms what was called by Abernethy *pancreatic carcinoma*, but is better named by M. Blegny *pancreatic growth*, the term *sarcoma* being strongly objected to by some pathologists, among whom I know is Sir Astley Cooper. Again, as Dr. Carcawell observes, the heterologous deposits may be uniformly disseminated throughout the texture of an organ, which it converts into a solid substance, resembling raw or boiled pork, and named by the French *meat cancer*, or *carcinome charnu*. Lastly, when it presents the appearance of firm jelly, and is without inclosures of greater or less bulk in a multitude of cells, it is the *embryo cancer* of Leichter; the cancer *gelatiniformis* in another of M. Cruveilhier. (See *Carcawell's Illustrations of the Elements of Disease*, fig. 2.)

11. *Lacineæ* constituted the basis, which is not at present adopted, that every heterologous deposit like those of *scirrhus* and *epithelioma* cancer, having nothing analogous to them among the genuine textures of the system, necessarily and inevitably had two stages, one of *cells*, the other of *fibres*. The mistake on these points is, that the heterologous deposit does not always enter after a certain period, though it sometimes does so partially.

In the period of *crudo*, *scirrhus* is represented by Lacineæ as a substance sometimes perfectly white, but, in other instances, bluish or grayish, slightly translucent, and whose consistence is such that dividing it with a scalpel usually causes a grating sound, the consistence varying, however, in different examples, from that of the skin of pork nearly to that of cartilage. The *scirrhus scirrhus* is ordinarily homogeneous, but divided into masses, which are again subdivided into nodules, united by a dense cellular tissue, whose arrangement, though exceedingly diversified, appeared to Lacineæ to exhibit a kind of regularity, and to resemble that of the cells of a honeycomb. In some cases, the fibrous layer, intersecting the scirrhous substance, presents a reticulated arrangement; in some, an arborescent distribution; and in others, an appearance as if it radiated from a central point in every direction around. Some *scirrhus*, when laid

open, are found to look very much like the substance of a lump.

When a section is made of a *scirrhus* in its first stage, we find, according to Mr. Trauer's description, "a tough, unorganized, and purely compact mass, of a white and yellow tinge (the latter smooth, and intersected by a slightly opaque fluid); its consistence is not fusible, being hard in the centre, so as to form a nucleus. The circumference is defined by the continuation of red vessels, forming a vascular boundary" by sensation. "The texture opens up as it bends into view concentric areolæ, having three interstices filled by a white granular matter, which may be picked out from the masses. These areolæ are crossed by faint white lines at irregular intervals, in the direction of soft from a centre, visible to the naked eye, and very conspicuous under a magnifier, giving the section some analogy to that of a lemon. In the second stage, when inflammatory action commences, and is accompanied by shoots of pus, the relative firmness of the centre and circumference of the tubercle becomes reversed, the centre being paler or tougher, while the circumference retains its firmness. The surrounding pus is overladen to have lost their natural elasticity by condensation of texture, and partake of the firmness and weight of the *scirrhus*, giving considerable apparent increase of volume to the tumour, which is now well defined at its margin, and is lost of a compound character." One particular opinion entertained by Mr. Trauer is, that the dense organs white lines, which, traversing the tumour in the direction of radii, and which is denser as they proceed outward, are not the trabeculae of the fibrous, but the septa, which divide and support the lobules of which the gland is composed, in an opaque and thickened state. (See *Med. Clin. Trans.*, vol. vi., p. 186.) The correctness of this view seems possibly doubted by the fact that the radiating white lines are met with wherever the scirrhous lesion is met with, whether in a gland or not, and sometimes shoot into the surrounding texture beyond the limits of the part originally attacked.

Notwithstanding the essential difference between *scirrhus* and *epithelioma*, seems to Dr. Carcawell to consist in the former having little or no tendency, the latter a greater to become organized, to become organized, it is sometimes impossible to draw a distinct line of separation between them; for the heterologous deposit, when first formed, and, indeed, frequently for a considerable time after its formation, does not furnish any signs which show that it will or will not become organized. 1. The heterologous substance may exist in the form of *scirrhus*, *pancreatic carcinoma*, or the *indurated tissue*, without presenting any trace of organization; the texture which it involves being gradually destroyed by its presence, and both ultimately converted into a soft, granular, pulpy, or *liquid* mass, of the colour or consistence of *crudo* or *meat*. 2. The heterologous deposit may exist under the same forms, but change into *imaginary* or *transitory* *scirrhus*, becoming more or less soft and vascular, and frequently terminating in *abscesses* by the rupture of its vessels, or in the state *hemorrhagic*, but improperly termed *fungus hemorrhoides*. According to Dr. Carcawell, numerous examples might be given of *scirrhus*, *epithelioma*, *sarcoma*, and *fungus hemorrhoides*, arising in the same initial state, and passing alternately from the one into the other in the order here

gated. Indeed, all the varieties, both of sarcoma and epithelioma, are frequently met with, not only in different organs of the same individual, but even in a single organ. (See *Crawell's Histogenesis of the Epithelioma of the Bladder*, p. 2.) A tumor which I lately removed in the North London Hospital exhibited, in some places, fine specimens of mammary sarcoma, while in others its consistence was cartilaginous or medullary. Sir Ashley Cooper once mentioned to me a case in which he removed a diseased breast, the substance of which corresponded to sarcoma; a return of disease took place, and the tumor was then of the medullary kind. A mucous texture of an unaltered form is rare in young persons. The examples in which it presents itself, in combination with medullary cancer, are principally noticed in individuals who have passed the middle period of life. Several of the varieties of both species of carcinoma appear to Dr. Crawwell to differ materially from one another with regard to the comparative rapidity of their development, as well as their reproductive tendency; a fact of considerable practical importance. In both these respects, the papillary differs from the lobular, the medullary from the fungiform, and the mammary from the medullary cancer: the first often remaining stationary for months or years; the last frequently acquiring its maximum of bulk in a few weeks; and, when removed, being sometimes reproduced with a degree of tendency which is never observed in any of the other varieties. Generally, the more the varieties of sarcoma and medullary cancer partake of the characters of cellular, cellular-fibrous, and fibrous tissues, soons, granular, the less rapid are they in their growth, and the less is their tendency to be reproduced. (See *Crawwell's Histogenesis*, &c., p. 2.)

If the disease be examined at the earliest period of its formation, while the heterologous substance has not effected the particular texture of the part in which it is contained, the resemblance of Dr. Crawwell proves that the *urinary substance* becomes manifest to our senses, either as a production of nutrition or of secretion. "In the former case (says he), it is deposited in the same manner as the nutritive element of the blood, enters into the molecular structure, and assumes the form and arrangement of the tissue or organ into which it is thus introduced. In the latter, it makes its appearance on a free surface, after the manner of natural secretions, as on various surfaces in general."

Another interesting fact in relation to cancer is, that the heterologous substance is sometimes found within the vessels. According to M. Andral, solid fibrine in the blood-vessels sometimes constitutes in organs whitish masses, similar to cancerous tumors. In the body of a milled-up man he found one of the lungs full of masses of this description. The middle ramifications of the pulmonary artery were packed with solid matter, of a dirty-white color, reddish at some points, and at others liquid, and like grayish bouillie. On being attentively examined, it seemed to M. Andral to be nothing more than solid blood, related to elementary fibrine, with a little of the coloring matter at some points, and here and there in a state of coagulum. M. Andral traced a similar matter to the smallest vessels, as far as he was able to follow them, and he was convinced that the whitish masses with which the lung was studded, instead of being a degeneration of the organ or an accidental production, as

it really consisted of small vessels filled with solid fibrine, more or less destitute of coloring matter. M. Andral likewise ascertained that cancerous masses are sometimes met with in the ramifications of the vena porta. He noticed the same thing in the kidney: a fibrous coagulum, of a dirty white color, was found occupying the total vein, to the extent of which it was adherent; and it extended into the ramifications of the vessel, so that it could be traced into the smallest branches, and into parts of the kidney where, previously to the dissection, only white or pale red masses had been seen, which Laennec would have termed the trophoblastic (medullary) matter in a state of coagulum. M. Velpeau, who had observed similar facts, was led to infer that cancer may be primarily developed in the blood. But, instead of adopting this conclusion, M. Huguier, under the name introduced by M. Andral, in which a certain change of the form of the blood is supposed to have an important share in the formation of some cancerous productions, (See *Dict. de Méd. et de Chir. Prat.*, t. ii., p. 12.) As Professor Cuvier remarks, the presence of the heterologous substance, which constitutes the several varieties of both species of carcinoma in the blood, is a circumstance of great importance; and, unless it be clearly demonstrated to arise in consequence of a modification of the blood itself, we should find it impossible to explain many of the phenomena which it presents, more especially those which accompany its formation in the molecular structure of organs and on the free surface of membranes. The following facts are regarded by Dr. Crawwell as furnishing strong evidence that the formation of this substance takes place in the blood, whether it be found in this fluid alone, or in other parts of the body at the same time: The presence of this substance, 1. In the vessels which supply in carcinomatous tumors, or in their immediate vicinity. 2. In the vessels of a portion or of the whole of an organ, in the former of which this substance is exclusively confined, and can be traced from the trunk into the branches and capillaries. 3. In vessels having no direct communication with an organ affected with the same disease; as, for example, when it is confined to a small extent of the vena porta; and, lastly, in blood which has been affused into the cellular tissue, and on the surface of organs.

Dr. Crawwell further observes, that the divisions of the vascular system, in which the cancerous substance has been observed, are the venous and capillary; and that in large veins, such as the vena porta and its branches, the malignant vein, &c., it may present the lobular, medullary, medullary, or branched characters, all at the same venous trunk.

The formation of these varieties of carcinoma in the blood is a curious and particularly interesting fact, more especially as bearing upon the long-disputed question whether cancer is a local or a constitutional disease. Dr. Crawwell believes that when the disease takes place in the intimate structure, or on the free surface of organs, its natural element is separated from the blood, and deposited under a variety of circumstances which modify its form, bulk, color, and consistence. He cannot, therefore, unite some pathologists, who regard the seat of the two principal varieties of carcinoma as limited to any one tissue, or who refer its origin to any modification of structure or special organization; and, with respect to the cystic origin of cancer,

point, as suggested by Dr. Hodgkin (*see Med. Chir. Trans.*, vol. xv., p. 202), he remarks, that the presence of cysts in the liver, walls of the stomach, lungs, kidneys, brain, lymphatic glands, spleen, and blood, is not to be detected at any period of the development of carcinoma, and, therefore, when they do occur in adult organs, as the ovaries, testes, mammae, &c., they must be regarded as a mere coincidence, or as a consequence of the disease, and not as a cause or necessary condition of it. (*See Carc. Illustrations of the Ethn. Form. of Dupuy, loc. 2*) The latter conclusion, I believe, has long been the prevailing one. We find it adopted by Home, Abernethy, and Travers. The latter remarks:—"Within the wall of the bladder, one or more cysts, containing a dark yellow or coffee-brown fluid, are sometimes met with, but are often not present." (*See Med. Chir. Trans.*, vol. xv., p. 202.)

Cuvillier regards all organic transformations and degenerations as exclusively the result of the deposition of morbid products in these living elements of organs, and he believes that these *three* phases are incapable of undergoing any organic lesion except hypertrophy and atrophy. But this view has been proved by Dr. Carc. to be incorrect, who shows that in the liver and stomach carcinomas can be distinctly seen to form in the histologic structure of proper tissue.

The form assumed by the carcinomatous matter seems to Dr. Carc. to be determined, in a great measure, by external circumstances. The globular shape usually occurs in organs possessing uniform density, and in parts situated on all sides to equal pressure. On natural and accidental serous surfaces, although the deposits may be at first globular, & frequently become pyramidal, either on account of the mode of attachment, or of less resistance being made to its growth in one direction than another. It assumes a fungiform shape when placed in circumstances facilitating its lateral or extending its anterior development, as when it meets with a dense, unyielding substance during its progress, or, having pierced the skin, is subjected to pressure. When accumulated in separate portions of the cellular tissue into rounded masses, grouped together, and included within a connective capsule, it generally presents a lobulated appearance, and, in the subcutaneous tissue in particular, it frequently exhibits the cauliflower or mulberry appearance. (*See Carc. Illustrations, &c.*)

This current pathological text notices the cauliflower arrangement of carcinomatous matter, as principally met with in the subcutaneous cellular tissue, and frequently in the form of thin vesicular patches, varying from the breadth of a pin's head to an inch or more. The cauliflower arrangement and modifications of it seem to him to depend upon the carcinomatous matter being retained in the veins, lymphatics, or lactals.

With respect to size, Dr. Carc. explains that the quantity of carcinomatous matter deposited in the molecular structure, or on the free surface of organs, is extremely various, but perhaps never so great in the former as in the latter. In the liver it may vary from the size of a pin's head to that of an orange. In more yielding organs, as the lungs, testes, and even the mammae, it may equal in bulk the head of an infant or of an adult, as exemplified in a case presented at University College, London; and, in the intermuscular and subcutaneous cellular tissue, the bulk is sometimes still more considerably,

Dr. Carc. very properly draws the attention of his reader to the influence of pressure in promoting or retarding the development of carcinomatous tumors. While their progress onward is resisted by an unyielding fibrous structure, they often remain for a considerable time nearly stationary; but, directly this obstacle is removed, they acquire a rapid increase of bulk, and, as soon as the skin sloughs, they often protrude the shape of enormous fungus.

The carcinomatous swellings which strike a very considerable size are not those of a sarcoma, but of a medullary texture. In fact, as Dr. Carc. observes, the tumor grows within themselves the power of increasing to an almost unlimited extent. It is to the cellular organization of such tumors that the rigidity of the growth, and their frequently great bulk, are to be attributed. A boy came to the North London Hospital with a medullary tumor, about the size of an orange, situated over the lower edge of the scapula; on ten days it occupied the whole of the axilla, reaching partly over its anterior margin, as well as very deeply into it.

I have already alluded to Laennec's doctrine that the consistence of cancer varies, and that it is greater in the early than the late stage. The term *scirrhus*, implying induration, is commonly employed to express the early, or solid stage of cancer, while a softer condition of the part or tumor is frequently confined to indicate a more advanced period of the disease. But, as Dr. Carc. remarks, the degree of consistence of carcinomatous formations is not an applicable character of a particular stage of the disease itself; for, when first perceptible they may be as hard as cartilage, soft as brain, or fluid as cream; or they may become soft or fluid, after having remained for a certain time in a state of hardness.

The variety in the consistence of carcinomatous formations is accounted for by Dr. Carc. to the following circumstances: 1. The nature of the organ in which the carcinomatous deposits are contained. 2. The chemical composition of the deposits. 3. The subsequent changes, occurring either in the deposits itself, or in the tissue with which it is in contact.

According to the analysis of scirrhus and medullary deposits, published by Lousin (*Trat. de Anat. Pathol.*), seventy-two grains of scirrhus least contained:

Albumen	2 grs.
Gelatin	10
Fibres	20
First fatty matter	20
Water	20
	70
Seventy grains of scirrhus thus combined.	
Gelatin	15 grs.
Fibres	10
Fatty matter	10
Water	25
	70

In the early stage of medullary cancer, the tumor contained a greater quantity of gelatin than scirrhus; and in the more advanced stage, when the carcinomatous matter varied in consistence of soft brain, the albumen was much more abundant than the gelatin. The same must be worthy of attention, now that medullary tumors are frequently termed *adenomas*.

According to the important researches of Prou-

Some Carcinoma, when we examine anatomically a mass of carcinomatous matter contained in a large vessel, or situated on the surface of a serous membrane, in loose cellular tissue, or on the surface of a bone or cartilage, we find it composed of the following elements in various proportions, viz., carcinomatous matter, cellular, fibrous, and serous tissues, and bloodvessels. The carcinomatous matter almost always forms by far the greater bulk of the disease. If its consistency be considerable, it presents a uniform granular or nodular arrangement; if soft, a lobulated one. The cellular tissue is found in small quantity, and so fine as not to be perceptible till the carcinomatous matter has been separated from it by pressure or incision. The carcinomatous matter is enclosed in it, and separated by it into granules, lobules, &c. These it intersects in various directions, and it serves to conduct the vessels which contribute to the nutrition and growth of the disease. The fibrous tissue is less frequently an element of carcinoma than the surfaces of organs; but the serous is often present, either covering the carcinomatous matter encysted, or forming cysts in it of various sizes, filled with gelatinous, albuminous, or other fluid. When carcinomatous matter is deposited in the medullary structure of organs, the quantity of cellular and fibrous tissues intersecting it in various directions is sometimes very considerable. (See *Carroll's Illustrations of the Elementary Forms of Disease*, p. 3.)

In true scirrhus the traces of vascularity are very faint, but in medullary cancer the abundant bloodvessels demonstrate a high degree of vascularity. The vessels resembling in them are not only numerous, but large. By some they have been considered principally arterial; by others, venous. Dr. Hodgkin is not able to decide to which class of vessels they are most nearly allied. These newly-formed vessels, though large and numerous, are extremely weak and fragile, and derive little or no support from the structure by which they are surrounded. Hence they are liable to give way at numerous points, whence proceed those frequent and extensive hemorrhages which have led to the disease being sometimes named fungus hæmatodes. (See *Hodgkin, in Med. Chir. Trans.*, vol. xv, p. 324.) According to Dr. Carwell, the vessels of epithelioma, or medullary cancer, vary in diameter from the breadth of a hair to that of a line, and grow in that peculiarity of distribution always more or less congested in newly-formed vessels, namely, the ramifications of which they are composed communicate with a common trunk at its opposite extremities, in the same manner as the hepatic and splenic divisions of the vena porta do with the trunk of that vessel. They are frequently ramous, and even to Dr. Carwell to partake more of the vessels than the arterioles character. He describes them as formed apart from the vascular system of the surrounding tissues, and constituting Geryper's circles of epithelioma. "The communication which exists between these vessels and those of the organ in which the carcinomatous substance is contained is frequently very imperfect, a circumstance which, together with the delicacy of their structure, renders them extremely liable to congestion and rupture. The most minute divisions of these vessels terminate by crystallized extremities in the carcinomatous matter, where they communicate with veins and arteries belonging to the affected organ. The latter vessels, which may

be said to form the callosities or capsules of epithelioma, are seldom so conspicuous as the former; but there are cases in which they appear to constitute the greater part of the vascular structure of the disease." The arteries and veins of scirrhus or scirrhus are only those of the vessels of neighboring tissues, which have become enclosed within the histological substance. (See *Carwell's Illustrations of the Elementary Forms of Disease*, p. 3.)

Nerves have never been detected in any of the varieties of carcinoma as a new formation; but they are sometimes included within agglomerated ligaments, or even in a single tumour that has happened to form in a situation through which they pass. (R.) Dr. Hodgkin is not aware that even a single nervous fibre has ever been discovered in the essential part of the adenoma growth. (See *Med. Chir. Trans.*, vol. xv, p. 226.) But, though the substance of medullary cancer is not supplied with nerves, the nerves may become the seat of the disease. This has often taken place in the optic nerve. (See *Wardrop on Pseudo-Hæmatodes*.) M. Jules Cloquet records an instance in which a carcinomatous tumour was situated in the great sciatic nerve, immediately below the quadratus muscle. At some points it was very firm, at others soft, while in particular parts of it there was an obscure feel of fluctuation. Its colour was a lustrous red, and its surface streaked with vessel capillary vessels. Some of the posterior filaments of the sciatic nerve passed behind the tumour, and were separated from one another on a level with it, but without any perceptible change in their organization; all the others were lost in, and complicated with the adenomatous growth, which consisted of the scirrhus and carcinomatous matter blended together, and presenting a marked appearance. (See *Jules Cloquet, Pathologie Chir.*, p. 187, fig. Paris, 1831.)

Mr. Cesar Hawkins concurs with the observations made by Sir Astley Cooper, M. Andral, and Professor Carwell, that cancer and encysted ligaments are allied to one another, so that the two structures may be found together, or a tumour of one kind removed from a part, may be followed in the same place by another of the opposite kind. "Even the local character of the scirrhus may be succeeded by fungus hæmatodes; for a case of chimney-sweep's cancer has been published by Mr. Langstaff, which was operated upon, and the patient died of fungus hæmatodes of the os innominatum, venter glands, and liver." (See *Lond. Med. Gaz.*, August, 1834, p. 681.) I have heard of several other cases confirming the truth of this observation; and one I saw myself, in a patient of the Brompton Dispensary.

Mr. Hawkins justly observes that some parts are more liable to one form of cancer than another. Thus scirrhus is common in the breast, but fungus hæmatodes (medullary cancer) rare; while the latter disease is frequent in the testicle, and the scirrhus variety of cancer rarely seen in it. Fungus hæmatodes of a single, or other well-textured, rare a different course from the same disease in a bone; and cancer is modified, according as it occurs in the breast, stomach, or uterus. In the skin, particularly, a considerable difference is observed in its appearance, progress, and degree of malignancy, from cancer at other parts; and even different parts of the skin are, in some respects, differently affected. (See *Haskin, Op. et. vol. vii., p. 685*.)

EXTERNAL CHARACTERS OF SCIRRHUS.

It was a remark made by Sir Richard Bright, that when this disease originates by a small portion of the glandular structure of the breast becoming hard, it may be easily distinguished by the hard part never having been previously circumscribed, and giving more the feel of a knot in the gland than that of a swelling distinct from it. The disease begins at a small spot, and extends from it in all directions like rays from a centre. This is one feature distinguishing this disease from many others, which at their first attack involve a considerable portion, if not the whole of the part in which they occur. Aberrantly conceived that, though a true scirrhous might be shrank, it could not be made to recede by the treatment which lessens other swellings. On this point, however, he was not positive; for other surgeons had informed him that diseases which eventually proved to be cancerous had been considerably lessened by local treatment. It is to be recollected, however, that some tumours which end in cancer are not born the first of this nature; consequently, in their earlier stages, they may yield, in a certain degree, to local applications, but completely resist these when the cancerous deposit has begun. Still we have the authority of Young, Remazez, Carcass, and others, for the fact that the growth of cancer may be retarded by methodical pressure, and sometimes the disease even cured. Perhaps, therefore, to assert that a scirrhous swelling is absolutely incapable of any diminution, would not be correct. We lately had a woman in the North London Hospital whose breast I removed on account of a true scirrhous. The disease, unfortunately returned in the form of hard tubercles in the skin, as well as an extension of the glands of the axilla and above the clavicle. Now, in this instance, the hard masses in the skin were observed to be much smaller at some periods than others. A scirrhous tumour is sometimes surrounded by more or less inflammation of the adjacent textures; and, upon the subsidence of it, the swelling will, of course, appear lessened. Notwithstanding these circumstances, the hardness of a scirrhous swelling to be diagnosed or diminished may be set down, without risk of inaccuracy, as one of its most confirmed features.

Another character of scirrhous is to involve the contiguous textures in the same diseased action. The skin, the cellular tissue, the muscles, the pectoral, &c., all become implicated, sooner or later, if they are in the vicinity of scirrhous cancer. In this respect Abernethy recognised no difference of it from testicular cancer, which is propagated along the ductum system, while the parts immediately in contact with the enlarged glands do not generally assume the same diseased action.

As a scirrhous tumour increases, it generally, though not constantly, becomes unequal upon its surface, so that this inequality has been considered characteristic of the disease. The circumstances influencing the shape of the carcinomatous deposit, according to Professor Carcass's views, I have already explained; they prove that the mere shape of the swelling is not a criterion of its nature.

Abernethy pointed out the error of dwelling too much on locomotion pain as a test of a scirrhous tumour: first, because it does not prevail in every case, or in every stage of disease in which it does occur; and, secondly, because it is a

symptom attending other tumours which are scirrhous in structure. (See Abernethy's *Essays*, vol. II, p. 16, &c.) M. Bérard agrees with Abernethy, that locomotion pain is by no means a characteristic sign of cancer; and it seems to him only to take place under circumstances where the disease is situated in an organ which is penetrated or surrounded by a greater or less number of nerves derived from the medulla spinalis, and suffering irritation. This happens especially in cancer of the breast, testis, and neck of the womb. As for cancer (scirrhous?) of the liver, kidneys, spleen, and lungs, it is alleged by M. Bérard scarcely ever to produce any locomotion pain, except when the disease has extended beyond the peritoneal cavity. (See *Dict. de Méd. et de Chir. Français*, t. II, p. 431.) The best of scirrhous tumours being often unaccompanied by such pain is now so generally known, that I shall merely add the evidence of Mr. Traube on this interesting point. "Not unduly," (says he) "the scirrhous tumour is perfectly silent, from the period of its formation to the close of life, undergoing very slight, if any increase, and giving, when much enlargement is approached, no trouble to the subject of it. A lady now under my observation has been many years so situated, enjoying uninterrupted health, though considerably above 70 years of age. The tumour is of the size of a hen's egg, and has the genuine scirrhous character. She takes nourishment as a beverage; and the probability is that when in no degree affects her health will not eventually shorten her life. (See *Med. Chir. Trans.*, vol. xv, p. 214.)

Scirrhous tumours are mostly developed slowly, without any perceptible increase in the temperature of the part, unless the texture, among which the cancerous deposits him, happens to be the seat of inflammation. As for the heterologous substance most, M. Bérard correctly regards it as a kind of foreign body, which may mechanically irritate the organs and textures in which it is placed, or more or less seriously impede their functions, so that when some are of first rate importance in the economy, the result is inevitably fatal.

A scirrhous swelling rarely, or I may say, never assumes the magnitude which the possibility of other swellings are disposed to affect. According to Sir Astley Cooper, it usually increases from the size of a marble until it requires two or three inches in diameter. "So," he truly observes, "that the true scirrhous tumour increases to a very considerable bulk, and this circumstance is one of its criteria." (See *Lectures*, &c., vol. II, p. 177.) Many scirrhous are even attended with a diminution or atrophy of the part. The presence of the heterologous elements in the surrounding textures fully explains these occasional partial and total atrophies.

By some writers, imbricated with the pathological anatomy of scirrhous, it has been asserted that tumour is not an essential character of the disease. Now this observation is only correct in a certain sense. "It is true," (says Sir Charles Bell) "that there is not always an increase of the dimensions of the whole breast; on the contrary, true carcinoma is often accompanied with contraction and diminution of the general bulk. But what is true of the breast or mamma is not true of the tumour; for the proper structure of the gland either atrophies or is progressed; and sometimes the surrounding fat is diminished by absorption, so that the whole mass is less than the

natural breast, or than what the breast was before the commencement of the disease. But still the diseased part is properly a tumour; there is an increased mass, a protrusional growth, or new matter, corresponding to the old definition without exception. But farther, and in respect to the surface membrane, the fat is not always diminished in carcinous mamma; but sometimes quite the contrary; and this difference is it will sometimes produce a variety in the external character, when there is none in the disease actually, or in the internal structure. Sometimes, from the disposition of fat, the irregular tuberculated structure of this disease will be apparent to the eye and to the touch, while in another patient the breast will be large, full, and smooth, only marked more than naturally with large blue veins, and having an ulcer like a hole in the centre of the breast." (See *Med. Chir. Trans.*, vol. xlii, p. 220.)

A truly carcinous tumour of the breast; capable of changing into open cancerous ulceration, and of a certain size, as described by Sir Edward Jenner as hard, heavy, and closely connected with the mammary gland, and, when moved the whole gland moves along with it. When, indeed, all the following characters are possessed, no doubt can exist about the nature of the disease: an early puckering of the integuments; a dull brown, or leaden-coloured appearance of them; a knotted, uneven feel to the swelling; occasional darting pain in it; an early fixed attachment of it to the skin above, and percolate outside underneath; and a retraction of the nipple. According to Sir Charles Bell, it is the ligamentous bands which produce the retraction of the nipple, by extending between the ducts, and destroying its spongy texture. (See *Med. Chir. Trans.*, vol. vi, p. 224.)

Mr. Trauer's description of the external characters of scirrhus is one of the best which I am acquainted with. "Hardness (says he), with increase of weight, indurability or toughness in some cases, knotty or craggy induration in others. Circumscription and mobility beneath the skin in its earliest stage, but not to such a degree in the subsequent feel as to allow of the fingers passing between the tumour and turning its edge upward. Next, &c., in the second stage, close adhesion to the tegument, and such incorporation with the glandular organ in which it is seated as to have its mobility lost; that of the gland itself upon the parts beneath. The adhesion of the skin either stretches, or partially betrays and puckers it, according to the smooth or irregular surface of the tumour, or to the close or loose attachment and particular conformation of the integuments at the seat, as, for example, next the nipple, and at a distance from it, or beneath the areolar membrane of the pyramis or areola, and the contiguous integument of the body. Third stage; contraction and distortion by pressure of volume in the gland as the tumour increases. Almost protrusion of one large, coloured tubercle, sometimes of several smaller tubercles or nodules. Irregularities of volume and hardness by topes or nodules. Transient pains, which have been likewise obscure and occasional, now more distinct and frequent, like the pricking of a sharp instrument, with a sense of heat or burning. Dusky or livid red colour of the skin, with repulsive tension. Extension or cracking of the skin at the summit or base of the tubercle, and fragrant eruptions, with ichthous and sanious odour. None of these signs is indispensably

diagnostic." (See *Med. Chir. Trans.*, vol. xv, p. 225.) To continue the same gentleman's description, the ulcerative process at length opens the tumour, when the cracked and livid integument, previously exuding a sanious white, viscidulent fluid, and the external opening is sometimes enlarged by a partial sloughing of the integument. Suppuration now takes place in the surrounding cellular membrane, and, as granulations spring up luxuriantly from the sides, the centre of the tumour caves, and becomes a cavity more or less considerable. The granulations have a spongy or fungoid character, and are elevated and broadly crested as to give the appearance of additional depth and breadth to the sore. "As the sloughing process enlarges and deepens the centre, the disease becomes exceedingly offensive; and although granulations continue spreading circumferentially as the ulceration, they have not the power of maintaining their vitality. This means that we attempt to preserve the ulcer from foulness and fever by different applications; we can render it clean, but in a day or two the newly-formed surface almost always retreats towards the centre." (See *Med. Chir. Trans.*, vol. xv, p. 211.) He adds, that in scirrhus it is not suppuration which, as in scrophulous and other tumours, brings the disease to the surface, nor does the skin ulcerate until after the wound. "Decomposed by a dense wall, the centre breaks up by necrosis, constituting the state of indurated cancer. Indeed, the scirrhus is seldom removed so early as to be found with its nucleus unbroken." (P. 213.) This observation agrees with that of Laennec respecting the softening process, who only erred in representing it as invariably taking place.

On dissection, Sir Astley Cooper observes that the breast is one solid mass, like cartilage, with very little vascularity except at its edges, and internally fibrous. When the breast has acquired any magnitude, he says there is generally an opening in it, in which case it has the appearance internally of being water-soaked and spongy. In the situation of the ulceration it is very vascular, and bloody serum is met with. The adjacent glands put on the same character as the scirrhus breast. The cellular membrane, skin, and arteries are also affected. Sometimes the diseased glands above the clavicle press upon the thoracic duct, and thus interrupt the transmission of chyle into the blood. Hence the appetite is sometimes voracious, though the patient is rapidly wasting. In the chest, on the same side as the disease, hydrothorax prevails, and the discontents of the pleura are in a morbid state, and small white spots, like pine heads, are visible. Trench of scirrhus disposes Sir Astley Cooper likewise represents as occasionally existing in the liver, uterus, &c.

But, on the other hand, attempts have been made by Hunt, Brouncker, and Alibert to represent the disease by inoculation, but always without any result in proof of the existence of a virus. The fact of the substance of cancer being often found within the bloodvessels, the same heterologous matter as is deposited out of them, sufficiently proves to my mind that the disease is constitutional, and depends upon a poison by which the adventitious substance is formed in or from the blood itself.

I once attended a woman who died of cancer of the uterus, and in the same room was her mother, all the forepart of whose chest was in a

ment, mutilated state from the effects of sloughing, by which, at different periods, she had been freed from tumors of both her breasts. Baron Dupuytren believed that it was particularly when the cancerous mass was encysted that the whole of it was capable of being destroyed by caustic, and the patient completely cured. (See *Journ. Hebdomadaire de M.-L.*, t. iv., p. 38.) Many years ago, Mr. Clark had a patient in St. Thomas's Hospital, in whom the sloughing process went on to such an extent, under a largest scutcheon, that the nose afterward healed soundly. "I have seen (says Mr. Travers) more than one case in which extensive gangrenes of noses existed, with much puckering and stretching of the skin of the chest, and no vestige of the breast remaining. In one of these, the patient, a lady in Berkshire, resisted the pressing advice of a consultation of London surgeons to allow the extirpation of the tumor, twenty years since. She has been in the constant habit of taking the medicine here prescribed, the extract of henbane, almost at bedtime. She is still alive, healthy-looking person, as formerly, and attributes her cure to the medicine." (See *Med. Clin. Trans.*, vol. xv., p. 218.)

Metastatic compression was first recommended and justified in this country, as a means of curing cancer, by Young; and the same practice was afterward put to the test of experience in the Middlesex Hospital, from which institution the report of Sir Charles Bell tends to prove that compression, applied either to scirrhous or to ulcerated cancer, is decidedly harmful. M. Roussel and Ferrus also came to the same conclusion. (See *Dict. de Mef.*, 1822.) The principal advocate for it at present is M. Recamier, who attributes the failure of it in the Middlesex Hospital to its not having been applied in a suitable manner, not modified according to the stages of the disease. M. Recamier combines likewise the administration of henbane with a very low diet, and he observes, that the latter medicine produces scarcely any effect. (See *Recherches sur le Traitement du Cancer par la Compression*, Single et Goubaux, 8vo, 2 tomes, Paris, 1829.) I lately tried Recamier's plan in a case of scirrhous in the North London Hospital, but it seemed only to accelerate the conversion of the disease into open cancer.

An escharotic, which has been of late strongly recommended for cancerous affections, is the chloride of zinc, employed in the form of paste. On this subject my friend, Mr. Gross, of Norwich, observes, "It can, of course, only avail where the disease is still local; but the cases related by Drs. Compton, Ure, and Rodger, many of which occurred under the eye of most able surgeons, prove that this escharotic destroys the scirrhous tumour speedily, leaving an ulcerated surface, which often readily heals; and, moreover, it induces no danger from absorption, which is a recommendation not possessed by the actualized paste." The crusts being first removed by a blister, the plastrum of paste is applied, composed of one part of chloride of zinc and two of sulphate of lime. (See *Lippincott's Med. Gaz.*, vol. xxi., p. 287; *Compton, Mémoires sur un Nouveau Mode de Traitement des Affections Cancerieuses*, Paris, 1836; and *Requien, New Treatise of Malignant Diseases and Cancer*, Lond., 1834.) This writer states that the paste not only destroys the tumour, but purifies the surrounding atmosphere. He uses the chloride of zinc, mixed with different proportions of flour, and has applied it to a chancre on the inside of the mouth, and also to

the os ment, with a good result. (See also *J. G. Compton in Proc. Med. Trans.*, vol. v., p. 23.)

Dr. Ure, in some observations on hypos, recently published, comminates the following particulars respecting the chloride of zinc. "The preparation of the chloride, which I presented and introduced into practice in this country, differs in a most important feature from that originally employed by M. Compton. The wheaten flax prescribed in the French formula is a spiritless vessel the chloride in a glassine dish, which plants its power, or, at any time, tends to confine its action to the particles on the surface of the paste; but the amorphous crystals of my formula, while it can exercise no chemical action upon the chloride, forms a porous medium, through which the whole of the particles of the subsequent chloride may transude upon the naked and tumorous tissue, with the effect of dissolving or dissolving it with certainty, to any desired depth. This preparation of mine has been adopted in several of the London Hospitals, and has been found to be uniformly in its action successful." (See *Land. Med. Gaz.*, Dec. 2, 1835.) The action of the chloride, and also of the chloride of zinc, upon albumen, and their consequences in relation to the albumen of cancer, are described in a paper by Dr. J. C. Warren.

[Dr. J. C. Warren has removed three hundred cancerous breasts, one sixth of which have been permanently successful, no more of the disease having occurred as far as is ascertained, which, if truly intermediate, is unprecedented.]

Dr. Joseph Parry, of Philadelphia, has left a valuable paper on the affections of the mamma liable to be mistaken for cancer. (See *N. A. Med. and Surg. Journal*, vol. v., p. 239; and in the sixth volume of the same journal, p. 334, will be found another paper by Dr. P. on the diagnosis and treatment of cancer.)

The experience of Professors Gibson, Yell, McClellan, Ure, and, indeed, that of nearly all from whom I have heard since America was known, in operations for the removal of cancerous mammae, is, that, when the disease has been preceded by scirrhus, and especially if the axillary glands have suffered, the curement is restricted in scope of the glandular tissue, and ultimately fatal. When, however, it has not been preceded by scirrhus, the cure by extirpation is often found to be permanent. Dr. Ure, of Glasgow, has lately removed a cancerous lip by the method of Velpeau, extending the incision upon the interior of the lip, and relying upon effecting subsequent union between the skin and mucous membranes by the oxyphosphoric solution. The operation was completely successful, though the patient was of very advanced age.—BATES.]

[CANGRUM ORIS. It is a perfect species of phagedenic ulceration, and in its worst form not unlike hospital gangrene, as I have seen several deplorable instances of. It also resembles the ulceration and sloughing in the mouth produced by mercury. The cancerous inflammation of the preputia of children is of a similar character. (See *Kidder's Med. Clin. Trans.*, vol. vi.)]

The disease is rarely seen, is slow, but not constantly in children from the age of eighteen months to that of six or seven years. The gums, as well as the lips and cheeks, are sometimes affected, in which circumstance the mouth is generally excruciating and loath. The ulceration is

usually attended with sloughs, which burst either through the cheek, lip, or just below the jaw. Eruptions are not frequent, and, when the disease is neglected, extensive sloughing sometimes happens.

According to Dr. Cuning, in most instances the ulceration, commencing in the gums, extends to the lips and cheeks, but sometimes it begins in the innermost transverse of the lip or cheek, and thence extends to the gums. This disease is set down by Dr. Cuning as most frequently making its attack during the period of the first dentition, though often met with in children between three and seven years of age.

When the disease occurs in infants on the breast, it is generally attended with a purplish and spongy appearance of the gums and roof of the mouth; and the ulceration, which lays bare the necks of the teeth, both externally and internally, is of a greenish or ash-colour, and very much discoloured blood. The salivary discharge is increased; the tongue is white; the mouth feels hot; the bowels are for the most part confined; and the child in general, exhibits under a greater or less degree of fever." (*See Dublin Hospital Reports*, vol. ix., p. 381.) Dr. Cuning has not seen this form of the disease personally, to the irritation of the four upper incisors, but he has frequently seen it when the child had only six or eight teeth; and he has constantly observed that, when it occurs thus early, it is the upper gum that is first and principally attacked. This appears to Dr. Cuning the mildest and most curable form of the disease, and he describes it as rarely attended with sloughing.

The second variety noticed by Dr. Cuning occurs in children between the ages of twenty months and seven years. The ulceration especially begins in the gums, whence it extends to the lips or cheeks. Sometimes it is of an acute, sometimes of a chronic nature, and attended, accordingly, with more or less sloughing. In the very worst forms, however, though the sloughing is considerable, the ulceration is always predominant. (*Op. cit. vol. cit.* p. 341.)

The third variety described by Dr. Cuning is at first confined principally to the cheek or lip. It begins with ulceration of their membrane, which is soon followed by that hard, red, shining, and circumscribed swelling, which, if the disease be not arrested, will speedily pass into gangrene. In this variety gangrene predominates over ulceration, and the constitutional disturbance resulting from it may prove fatal.

Living in a marshy situation, want of wholesome food, and attention to cleanliness, are conducive to this disorder, which is often met with in houses where children are crowded together. One of the worst cases, however, which I have ever seen, was in a child of an opulent family in Essex. The complaint is sometimes suspected to be contagious.

The first or mildest form is well known generally to admit of being cured by purgatives, aided by some of the applications presently specified.

In the second form, Dr. Cuning, after cleansing out the bowels with a weak cathartic, confides chiefly in an alterative of mild purgatives with astringents. The local applications preferred by him are the black wash, and a dilute solution of mercuric acid in honey. When the ulcerated surface is in contact with canines or loose teeth, these should be removed. Dr. Cuning tried the

liquor arsenicalis and cold salt-water-bath with-out advantage.

In the third variety, where gangrene is predominant, the disease rapidly proves fatal. Dr. Cuning has employed various local applications, such as the mineral acids, dilute and pure; the oxygal argentea, the butter of arsenic, solution of the nitrate of silver, the black wash, &c., but mostly without any good effect. I have likewise tried all these applications in vain, as well as solutions of the chloride of soda of different strength. With such external means, cinchona, sulphate of quinine, carbonate of ammonia, opium, and wine, have been prescribed, all for the most part, unavailingly. (*See Cuning in Dublin Hospital Reports*, vol. ix., p. 383, 385.)

The treatment recommended by Dupuy consisted in administering mercuric acid internally, using it as an application to the disease; giving the patient a nourishing diet, with jelly, wine, &c., and occasionally presenting an emetic.

In the worst form of the disease I have found the concentrated nitric acid one of the most useful applications, especially when noticed with the internal exhibition of sulphate of quinine and diasterephoric acid.—C.]

CARBUNCLE. Besides the diffuse forms of abscess and phlegmon of the subcutaneous cellular tissue, there is likewise "a circumscribed form," which is observed in furunculosis, carbuncle, or boil. The great accumulation of blood, and the still greater and rapid effusion of pus, which takes place in these circumscribed acute inflammatory affections, produce a state of extensive induration of the cellular tissue, a greater or lesser portion of which, long time as it is stagnated, dies from want of nutrition, becomes separated from the living parts, and is expelled in the form of a gray or straw-coloured spongy or jellyy mass, through an opening made in the skin by a similar process, by ulceration, or a surgical operation." (*See Cruveilhier's Illustrations of the Elementary Forms of Disease*, p. 7.)

Anthrax, or erysipelas carbuncle, resembles a boil (see Furunculosis) in being attended with gangrene of the subcutaneous cellular tissue, and, if one high authority can be relied on, certain processes of this texture within the skin. (*See Dupuytren, Clin. Chir.*, vol. iv., p. 155.) It is remarkable for constituting a circumscribed dark red or livid swelling, accompanied by burning heat, stiffness, and for soreness in the part; and occurring most frequently in parts of the body where the skin is thickest, and abounds most in those processes of cellular tissue which are described by Dupuytren as extending between its vessels. "Thus the nape of the neck, the back, the spaces over the scapulae, the sides of the chest, and the nates, are the ordinary situations of anthrax."

Anthrax differs from a boil not only in being of more obdurate size, but in being usually single, and lasting by several small apertures, whereas several boils frequently form together or occur in succession, and when one of these tumours breaks, it goes to by a single opening in its apex. The skin which covers the anthrax, and especially what lies over its centre, is of a deeper and more livid red colour than what is seen over a boil. The mortified cellular tissue is deeper and more extensive in anthrax than in a boil, in which it forms only a central nucleus or core. The surface of the tumour is flatter than that of a boil, which always rises in a conical shape above the level of the skin, while its base

does not penetrate so deeply as that of a carcinoma, which is a great deal broader than the more superficial part of the tumour. It is the nature of anthrax to produce gangrene and disorganization of the subcutaneous cellular tissue, and sometimes a destruction of even the adjacent muscles and deeper tendons; the mass of dead parts constituting frequently a slough of a lightish colour, part of which, mixing with the discharge, sometimes constitutes for it an appearance compared by Sir Astley Cooper to that of flax and water. Sometimes, however, the matter is bloody and viscid. Blisters, chiefly occur in children and young phlegmatic persons; the anthrax is mostly seen in subjects beyond the middle period of life, whose constitutions have been seriously impaired by intemperance or other causes.

The occurrence of anthrax on the lips is uncommon. Mr. Hunter, however, had seen the disease so situated. I have met with examples of it on the upper, side of the neck, in various parts of the bark, and on the nose.

Anthrax, or common carbuncle, is essentially different from the malignant pustule, so frequent in some of the southern parts of Europe (see *Gazette, Med. de Calcutta*, 1818, p. 104, &c.), in not being contagious. It differs also from pyoderma and malignant ophthalia (the carbuncle of Fernel and Celsus) in the same important respect. (See *Diagnos. Clin. Char.* 1818, p. 111.) This latter also regards the malignant pustule and festulant carbuncle as essentially contagious diseases, whereas simple anthrax seems to him to be so merely from stimulation of the processes of cellular tissue extending into the structure of the true skin. The correctness of this statement seems to be rather doubtful, because there can be no contagious species, whether benign or malignant, without a gangrenous disorganization of the cellular tissue, and the influence of constitutional causes. This is certain; but, whether contusions of the inflamed tissues, as alleged by Dupuytren, be the principal cause of gangrene, is a point which is far less clear. We find, indeed, that it is the character of carbuncular inflammations, first to produce sloughing of the cellular tissue, even when this may not be covered by any dense unyielding parts, though occasionally it afterward destroys all textures down to the vertebrae or scapula themselves. The gangrene, I should say, is independent of the constitution and confinement of the tissues affected.—C.]

[CARIES. The prominent feature both of absorption and caries is loss of substance through absorption. But, as Mr. Mayo properly observes, "caries is something more than mere absorption. When an abscess of the acetabulum against the acetabulum or vertebrae, the bones are gradually resorbed through; they are partially absorbed, but they are not caries. When, however, the focus attacked with hip, and the ulcer spreading in depth and breadth, reaches the bone, and then becomes excavated enormously, with the soft parts in the subjacent ulcer, the osseous tissue is not only absorbed, but truly caries. In caries, absorption is preceded by a change in the bone, which (with very few and doubtful exceptions) has a well-marked inflammatory character. The same modified mode during the progress of the absorption. There is further present an imperfect reparative action, which is shown in the narrow less partial growth of an osseous granulation from the abscessed surface. Of

these changes, the inflated condition of the bone is the primary and most important; the absorption is secondary and accidental. Absorption may be prevented by adding the iodine solution, or may, after laying begun, be arrested, and the crop of unabsorbable granulations transformed into a healthy reparative growth, if the case is of such a nature as to allow of the suppression of the inflammatory or specific action."

Mr. Mayo enumerates four kinds of caries: 1. *Simple*, when, in a person of sound constitution, a state of suppuration and protracted ulceration is set up in a bone through some accidental local cause. 2. *Syphilitic*, when ulceration is a specific periosal inflammation produced by lues. 3. *Strumous*, when the secretory ducts give origin to cysts. 4. *Malignant*, when the bones are affected in the extent of malignant ulcers. (See *Outline of Human Pathology*, p. 36.)

According to Mr. Mayo, syphilitic caries begins with inflammation of the periosteum, and "does not lead to much enlargement of the bone. The bone, commonly attacked in these cases, lying near the surface, can be observed to swell; the skin for instance, the skin, the clavicle, the cranial bones." The swelling by which syphilitic caries first manifests itself is called a "swell." It is an inflammation either confined to the periosteum, or involving, at most, the cortex of the bone. The periosteum becomes thickened, and is exquisitely painful. If the abscesses are divided down to the bone at this period, a thick, viscid, glairy matter, like honey, is observed in the cells of the periosteum, &c. The contents of the bone now gradually enlarge, or is thrown up in particles of porous bone, either formed by longitudinal grooves, or spongy and scab-like, filled with unabsorbable minute holes." The outer table of the skull, in several cases, generally has the appearance of being warm-colored. Mr. Mayo adds, that while the caries is making progress, the interosseous surface and matter forms below the skin, which afterward ulcerates. The skin, before breaking, has a livid colour, and afterward the skin around the ulcer has the same hue. The edges of the ulcer are excessively a little raised, its outline uneven, and the granulations irregular, and covered by a viscid, ash-colored secretion. A probe readily passes through the soft and gritty texture of the bone. The continuance of ulcerated areas and squamous eruption, or other disease of the skin, generally leaves no doubt of the nature of the caries. Sometimes, however, the latter exists alone. (See Mayo's *Outline of Human Pathology*, p. 40.)

Mr. Mayo is unacquainted with any essential difference in the appearance of cancer bone in some forms of scrofula, and in the period more dependent upon lues. "Less pain, less general inflammation, and a smaller extent of surface attacked, the absence of other symptoms, and the general physical appearance of the patient (he adds) afford a strong presumption of the scrofulous origin of the disease." (Op. cit. p. 41.)

The instances of traumatic caries noticed by Mr. Mayo are those from lipa and cancer (p. 42).—C.]

[CATARACT. PROBABLY DOUGLAS has succeeded in restoring sight to a child affected from congenital cataract on both eyes by the operation of becoming the lens. The child was three years of age.

Dr. McClellan has been very successful in the cure of cataract, and has performed extraction 72 times, chiefly for the least variety. In capsule and lenticular cataract, he relies upon simply excising a portion of the anterior capsule with a curved needle, and avoids disturbing the vitreous humor, or even dislocating the lens. He has had extensive experience in making an artificial pupil, having repeated this operation very frequently with success.—*Ransom*.

[CLAVICLE. Dr. J. C. Watson, of Boston, has performed the resection of the clavicle for osteosarcoma, but without the success which attended the operation of Dr. Mott, and its repetition recently by Mr. Travers.

Dr. McClellan, of Philadelphia, has successfully removed the clavicle and scapula for the same disease, and the patient has recovered. Dr. Munsey, of Cincinnati, has also successfully accomplished the removal of these bones in a case, the particulars of which promise great interest. (See *Amer. Jour. of Med. Sciences* for 1875).

Dr. T. D. Muller, of Philadelphia, has removed a part of the clavicle at its sternal extremity, including a portion of the sternum, for cancer of these bones. The best tips left at this important point of articulation has been fixed by a fibro-cartilaginous structure, so that, six-eight weeks after the operation, the motions of the upper extremity were perfectly restored.—*Ransom*.

[CLUB FOOT. In the article Tendons, Mr. Cooper has only made a brief reference to the new operation of dividing the tendons for the cure of talipes or club foot, and for the removal of other deformities; and in the *Achilles* I find the following article on the subject.

[CLUB FOOT. In the article Tendons I have noticed the operation of dividing the tendon of Achilles as a means of restoring the foot to its proper position in certain examples of this deformity. A great deal has been published on the subject of machinery for club feet; but, as Dr. Duguytren justly observes, the history of such cases was left very defective in consequence of no anatomical examination having been made of the parts affected. In the most frequent congenital distortion of the foot, termed by the ancients *varus*, the point of the foot turned inward, and the dorsum downward, so that the patient walks on its inner edge, and sometimes even upon the dorsum itself. The second, much less frequent variety is that called *valgus*, in which the foot is turned outward. There is also a third variety, in which the point of the foot is drawn backward, and the position of the whole foot is so reversed that the patient walks mainly upon the instep. Dr. Duguytren looks upon a dislocation of some of the bones of the tarsus, together with a subsequent change in the arrangement of the ligaments and tendons, as the essential cause of the deformity. All the external appearances of club foot were well described by Scarpa; but, according to Dr. Duguytren, no writers have hitherto attended to the affection of the tendons of the limb and its atrophy. "The deformity (varus) may be restricted to one foot, or extended to both. In the first case, if the instep be examined shortly after birth, the affected foot will usually be found much smaller than the other, but the two limbs are of the same length. When both feet are implicated, they are, in general, equally developed. In proportion as the time from the period of birth becomes longer, the atrophy becomes more and more evident, and the cause of

it is very applicable. In fact, the child, from inactivity, as it were, bears upon the sound foot, on which all the weight of the body is thrown. The result is, that its nutrition is more active; while the deformed foot, remaining comparatively inactive, must, on the contrary, dwindle away.

"But this atrophy is of two kinds, which have hitherto been confounded, though they should be discriminated: 1. Atrophy, according to the diameter of the limb; 2. Atrophy according to its length. The first kind chiefly affects the muscles, and hence the weakness and weakness of the limb; the second extends both to the muscles and the bones, but its action on the skeleton is the most serious and important; for the atrophy of diameter may always be removed by exercise of the muscles when the club foot has been rectified, while nothing can correct the shortened state of the limb." Though the shortening of the muscled and tendons is generally less in degree than that of the bones, yet it seems to Dr. Duguytren that it should be taken into consideration. "Thus (says he) the tendon of Achilles, at the age of twenty, has lost so much of its length that, even after the natural direction of the foot has been restored, the patient, in order to be able to lean on the ground, is obliged to wear a high-heeled shoe." Hence Dr. Duguytren insists on the importance of beginning the treatment of club feet very early, in consequence of the greater facility of the cure. In a very young infant, the foot may be rectified by the mere hand, and without pain; but at the age of ten or twelve years, machinery becomes necessary, and at a later period it fails, for nothing will then restore the length of the limb, nor even its shape and complete functions. (See *Duguytren, Clin. t. iii., art. 6*.) Occasionally a club foot undergoes a spontaneous cure, of which an instance is recorded by Dr. Hall. (See *Reperoire d'Anat. et de Physiologie*.)

The cure of club feet by division of the tendon Achilles, in cases otherwise inextinguishable, is one great improvement in modern surgery. Indeed, the division of other tendons for the relief of the permanent contraction and shortening of muscles is now occasionally practised with decided success. (See *Tendons*, p. 40.)

The novelty of this subject, and its importance to the profession, as well as the attention these operations have received in America, require a much fuller notice than is here given. The numerous examples in which maiming and lameness have been repeated in various congenital and acquired deformities, both in Europe and in this country, have created a new specialty, which has received the name of *Orthoplastic Surgery*, and one which is deservedly attracting a large share of attention both from the profession and the public.

The original suggestion of curing woe the tendon Achilles in club foot is due to Thomas, a German physician, and in 1794 it was successfully performed by his direction. Mr. Charles is [200], and Saraceni in 1812, repeated it in Germany with the same success. The late Dr. Dupuytren, presented it in France in 1822, but, though successful in the end, the cure was so long delayed, and attended with so much difficulty and danger, that his countrymen disapproved its repetition, and for the time the subject seems to have been everywhere abandoned. Indeed, when it is recollected that the frequency of this deformity in every country was increasing, and its victims included some of the most distin-

gished men among the European aristocracy, of whom were Prince Talleyrand, Lord Byron, and Sir Walter Scott, and that, for the removal of these deformities, no effort was made, we have the most conclusive evidence that no confidence existed in the safety or propriety of the operation. Anticipation of the suffering neither was the only restraint which was alluded to, and this was accordingly performed in numerous instances. An eminent surgeon in New-York ascribed the loss of a gentleman for club foot as early as 1834.

In the year 1834, Dr. Stearns, a celebrated German surgeon, revived the operation, dividing the tendo Achillis by a subperoneal incision; and, having been successful in two cases of club foot without any untoward symptom having followed, he soon after published an account of the cases and their results. Among the earliest of his imitators were Dr. Dickson, of North Carolina, in 1835, Dr. N. R. Smith, of Baltimore, in 1836, and Dr. William Denold, then of Hanover, but now an eminent surgeon in the city of New-York, in 1837; and the latter having been the first to publish an account of his operations in the United States, which he did in the *American Journal* for May, 1838, he has probably had more extensive opportunities than have fallen to any other surgeon, either in the Old or New World. Dr. Denold has now performed more than 400 operations in club foot, and divided more than 1500 tendons in Stearns's plan of subperoneal incision.

His extensive opportunities and experience have proved, 1st, that the disease formerly supposed to be consequential upon wounds at tendons are wholly arbitrary; 2d, that the mode of a divided tendon takes place readily and infallibly, however the cut ends are separated by the restoration of the heel and foot to normal position; 3d, that a large proportion of the deformities called club foot, including congenital cases, regarded as hopeless malformation, can be cured by the division of the several tendons upon the contraction of which the deformity depends, and by means of subsequent mechanical management. "In all his experience he never saw an unsuited tendon follow his operations, nor has he had a single example of aneurism or any other troublesome sequel."

In the last edition of the *Institute of Surgery* by Professor Gibson, of the University of Pennsylvania, will be found a highly interesting and discriminating account of the nature, causes, varieties, and treatment of club foot, written for the work by a son of the author, Dr. Charles Bell Gibson, at Baltimore, a young surgeon who gives promise of early eminence in his profession. From this article it will be seen that the disease may be either congenital or accidental. The former are ascribed by him to some malformation of the foot in utero, and the latter may result from fracture, laceration, apoplexy, ulcers, or partial paralysis.

He enumerates five varieties of club foot, viz, 1st, *Pes equinus*, when the patient walks on the toes or the metatarsophalangeal articulation; 2d, *Varus*, in which he efforts upon the outer portion of the dorsum of the foot; 3d, *Valgus*, in which the limb rests on the inside of the foot; 4th, *Phalangial*, in which the patient struts on the distal face of the second and sometimes bones of the tarsus, the toes and metatarsal being turned under the heel, and the fore part of the foot lies with the axis of the limb; and, 5th, *Talus*, in

which the heel being directed downward, the dorsum of the foot is applied in front of the leg.

The varieties of club foot have been thus more intelligibly defined, viz., *Talus equinus*, abnormal extension of the foot; *Talus varus*, extension of talus, abnormal flexion; *Talus valgus*, extension with adduction; *Talus valgus*, flexion with abduction. The other varieties will be found to be but complications of these, or groups or lack directions, though belonging to one or more of these feet.

Of these varieties the most systems would seem to be a combination of the first and second varieties, and each of these five varieties, though easily recognized, will be found more or less complicated by the greater or less extent of displacement, diagnostic of each. And when they depend in whole or in part upon muscular contraction, a number of tendons other than those of the gastrocnemii will be found to be involved. Cases of double club foot are often found among congenital examples.

In regard to the treatment of club foot, Dr. Gibson, beginning with the bandage, traction, and shoe employed for the purpose by Hippocrates, traces down to the present and the multiplied surgical and mechanical methods to cure these deformities by mechanical apparatus, of which, indeed, both he and his distinguished father were disposed to speak with much fervor, and they express a doubt as to the possibility of benefit derived in successful cases from the removal of the tendons, when the apparatus is not provided in the subsequent management; and they seem inclined to ascribe the cure to the apparatus alone, which they regard as in some cases a competent remedial agency in the removal of these deformities. The apparatus of Dr. Huber Chase, of Philadelphia, is spoken of as having been successful in removing the deformity of club foot, in no different varieties, by mechanical means alone.

The principles upon which Dr. Chase's apparatus operates are nearly the same which have been from time immemorial regarded and practiced, inadequately, however, with but little success except in uncomplicated cases, or when applied soon after birth, in the congenital variety. For the accidental form of talipes, or when the case is in an adult, the utility of any form of retentive apparatus has been more than doubtful, and in cases reported by Dr. Chase, have appeared to be that such deformities may be removed by the modification of mechanical means, which, alone, he believes, possesses the power of greater superiority than the very complex apparatus formerly employed. His experience thus far has been highly satisfactory; and some of the cases reported in the *American Journal of Medical Sciences* and other periodicals, while they reflect great credit on his science and skill, they certainly render it probable that a large proportion of these and other deformities, for which apparatus and tenotomy are coming in vogue, may be better removed by mechanical means than by the use of the knife. Still, however, it must be remembered, even by those who have marveled themselves against the innovations of antiseptic surgery, that there are varieties of club foot for which the division, not merely of the tendo Achillis, but of the tendons of the anterior and posterior tibial, peroneal, &c., will be found indispensable as preliminary to the successful employment of any apparatus; and, as in all cases when the cause

tion of tertiary, precisely similar mechanical strains are demanded as when these are originally called on, there need be no strife between the advocates of either method other than a laudable ambition to excel in their success by removing the deformity, and restoring the limb to usefulness and utility. No enlightened or reputable surgeon will be indolent enough to practice the operation in any case where mechanical means hold out a rational hope of success without it; nor should any such beautiful devices, tendons or muscles, be any extent demanded, for the removal of such deformities, after the multiplied and satisfactory proofs before the profession of the safety and benefit of these operations, even in cases to which no mechanical apparatus could be possibly be adapted, or in which the attempt has been fairly and fruitlessly made.

In Europe, especially has been very frequently performed in these cases by Dieffenbach, Day, Bruns, Roux, Lispen, Whipple, Koenig, and others; and in this country, since it was introduced to the profession by Dr. Denold, it has been repeated by surgeons in almost every part of the country. Professor Mott has returned from his European tour and temporary foreign residence so impressed by what he witnessed while among transatlantic surgeons, that he has projected in New-York an orthopedic institution, devoted to the reception and treatment of all the deformities and malformations for which this new department of surgery is adopted, and which he designs shall be a school for teaching this specialty, and widely diffusing the advantages throughout our country by clinical lectures and published reports of cases. Dr. Denold, meanwhile is almost daily receiving patients in the same city from various parts of the United States, by which it is ascertained that the cases of club foot are vastly more numerous than was ever imagined until the method of cure was discovered. As this profession has devoted himself almost exclusively to the department for a number of years, and is now engaged in lecturing on the subject before the College of Physicians and Surgeons in New-York, I would refer to an elaborate paper on the subject, in the N. Y. Journal of Medicine and Surgery, which is remarkable for its eminently pathological and practical character. It may be found in the number of that quarterly for January, 1861.

From Dr. Denold's valuable publications on this subject, I must content myself with a brief analytical summary of the theory and practice. He divides club foot and knotted deformities into three to the same extent, a disturbance of the equilibrium between antagonistic muscles, and he examines the various opinions of other surgeons on this topic at length. At the date of the publication, 1860, he had been consulted in 167 cases, of whom 95 were males and 72 females. In 93 both feet were affected, in 41 only the right foot, and in 31 only the left foot. Of the 167 cases, 135 were congenital. Of these, 115 were otherwise well formed, 11 had some other congenital defect, apparently independent of club foot; in two the whole extremity, femur and tibia, were essentially short; in the rest half the length of the other sound extremity; one had a heavily scrooped squinted; one had the toes of the club foot grown together; and one had an additional thumb, that is, two thumbs on the hand corresponding with the club foot. To these and similar statistical information collected with great discrimination by Dr. Denold, he has dis-

gently inquired into the properties of hereditary cases, which in almost every instance is on the father's side, perhaps for the reason that club foot females seldom marry; and Dr. Denold reports a single example having occurred in the progeny of a childless mother whose infant had the maternal deformity.

Of the 167 patients, 53 being females with foot-club, furnish for the statistical inquiries 320 club feet; and of these 320 were of the species called talipes varus, which is vastly the most frequent form of the distortion. Only 11 were of the species called talipes valgus; 17 were of the form named talipes equinus; and but one of the species called talipes calcaneus, and it existed in both feet, which merit to the cured variety. Dr. Denold suggests for this last variety the name talipes equineus, for the reason that it resembles the position of the foot in the stumps in the act of riding.

In respect to the treatment, we have here a corroborated, no doubt, accurate investigation of the cases which may be cured by mechanical means alone, and those in which surgery is either necessary or advantageous. Dr. Denold is far from advocating the indiscriminate division of tendons by the knife in every case of club foot, and still less does he approve of the practice, sometimes resorted to unnecessarily, of putting a number of tendons. He inquires that in a great majority of cases the division of the tendo Achillis is the only cutting which is demanded; especially in young subjects, though he admits that sometimes, in older subjects, the cure may be facilitated by dividing, in addition, the fibula anterior and posterior, the flexor digitorum, and sometimes the extensor digitorum; and in yet rarer cases, the peroneal, and that, in degeneration of long standing, one may possibly be aided by cutting the ligamentum plantare. Still, in nearly all cases, it is better only to divide the tendo Achillis, and then attempt the cure by extension, at least postponing any further division of tendons until, in the progress of the treatment, it becomes absolutely imperative.

Our space will not permit the introduction of the exhaustive list of the modes of operation of surgery, or the resources by which it is sustained. Nor can we enter upon the details concerning the instruments, or the manner of using them, either for dividing the tendons, or for supporting and extending the limb, in the subsequent mechanical treatment. It must suffice to remark that Dr. Denold is opposed to the immediate extension of the foot by any apparatus, but prefers waiting two or three days after the operation. The apparatus of Stinson has been suggested by Dr. Denold, and he greatly prefers it to the mould of plaster of Paris over the deformed foot described by Guerin. He also employs the shoe of Scarpa.

Dr. Denold has divided the muscular tendons in a case of contraction of the ligament which was essentially relieved, but his results disturbed this just ordered plan for the success of extending. He also, however, writes in contradistinction of the upper extremity, we can never be so successful as in the lower and foot, though he has offered considerations of the whole by dividing the biceps, and those of the wrist and fingers by cutting the flexors. The difficulty in these cases arises mainly from the impossibility of simultaneously availing ourselves of mechanical means of support and extension, while in contradistinction of the lower and ankle-joint we

money will seldom fail, it being so easy to adapt the apparatus to the lower extremity.

Dr. Denold speaks favourably of the division of the *sternoclavicular* tendonless for very thick, but expresses himself doubtfully of M. Guerin's operations on the muscles of the back for lateral curvature of the spine. The success which has attended this operation, however, in the hands of Guerin, since this paper was written, would seem to promise much for it in future. It is worthy of remark, however, that Dr. Denold suggests the division of the muscles of the eye in strabismus, and avows his conviction that, like club foot, it depends on spasmodic muscular action, and he duly hesitates in recommending the division of the muscles of the eye from a doubt whether the slight inconvenience would justify such an operation. At the time this paper was written, Stromeyer had, in like manner, made the operation, but the operation had not then been performed.

Dr. Denold's paper concludes with a detailed narrative of thirteen cases, with their treatment, of which we have only room for an extract from the summary, by which we learn that of the 220 cases, the tendo Achillis alone was divided in 163, and in seventeen, this, with other tendons, and the *aponeurosis plantaris*. In three cases the operation was repeated on the tendo Achillis. All the eleven cases of valgus, and the only two of calcaneus, together with forty-two of, *varus*, were treated by mechanical means alone, without tendotomy.

For other muscular contractions, Dr. Denold has divided 1 *spino-plantar* tendonless, 1 *iceps* tendon, 1 *brachio-caps* tendon, 1 *flexor carpi ulnaris*, 1 *palmaris longus*, 1 *flexor digitorum* tendon, 4 *flexor tendons* of separate fingers, 1 *peroneus*, 4 *iceps* tendons, 7 *antimembranosus* and *scaphoideus*, 5 *extensor tendons* of separate fingers, 4 *flexor tendons* of separate toes, besides a number of times different portions of fascia and aponeuroses. In all these instances the disease was, effected subcutaneously, and the external wound healed by the first intention.

Dr. Munier, of Philadelphia, has also acquired great and merited reputation in orthopedic surgery, and his opportunities have been extensive. He has already treated more than 200 cases of club foot, either with or without tendotomy; 13 cases of very thick, 4 cases of contracted elbow, 15 of contracted fingers, 32 of contracted knees, 3 of rigid ankyloses, and 89 of strabismus, and has had extraordinary success.

The extent to which tendotomy and myotomy has been practiced, especially in Paris, may be estimated by an example recently published by M. Jules Guerin, of Paris, in which he made a subcutaneous section of forty-two muscles, tendons, and ligaments on the same person, and at one time, for the cure of a general atrophic deformity; and yet, in this and similar extraordinary instances, no unusual results have followed.

M. Guerin, who is the celebrated filius of the Gazette Medica, has also applied the principle of division of tendons to remove lateral curvature of the spine, and many cases, both in private practice and at his orthopedic institution near the Bonaparte, attest the success which has crowned his efforts, conjured as they are with pure science and consummate mechanical skill.

In Duguesne's Amer. Med. Intelligencer, for May 1st, 1849, there is an article by A. G. Wal-

ter, M.D., of Pittsburg, by which it appears that Dr. W. has greatly improved the convenience of a patient suffering under extensive distortion of the lower limbs, by dividing the tendons and muscles of the hip, the knee, and the ankle. He first divided the attachment of the adductor longus and gracilis muscles, with the fascia lata on each side, by introducing the knife about an inch below Pott's ligament, and then extended the foras, which was before impossible, so as to cut the tendons of the sartorius, gracilis, semi-tendinosus and semitendinosus in each limb, and thus was enabled to give maximum to the knee, which had been previously fixed, and, lastly, he divided the tendo Achillis and portions of each foot, for the removal of that variety of club foot called valgus. The power, for the division of the peroneus muscles, to go below the malleolus externus. All these tendons were treated subcutaneously, making five incisions through the skin by dividing the muscles and tendons on each extremity. Subsequently an elaborate mechanical treatment, first, at the knee of the support, his stitches had increased in value, and with the aid of crutches he could walk very well, and there appeared every prospect of complete success, attending the operation, though the case was an unfavorable one, being to the very existence of constitutional disease being child hood, this appears still after several months which accompanied it, and the number of years in which locomotion of the limbs had been lost of the epidemic. The complete removal of the deformity of the several joints, and the fragments of the patient by allowing the extreme necessary to his restoration, of themselves, with the operation to great merit, who possesses very creditable success, even if to further experiment should be attained.

Dr. Allen C. Post, of New-York, has treated with success a considerable number of cases of club foot and other analogous deformities. In one case of complicated deformity, he divided the tendo Achillis, the plantar fascia, the muscles of the tarsus metatarsus and peroneus, and of the flexor longus pollicis polvis, the two external tendons of the toes, the peroneus longus, the semitendinosus and semitendinosus, the gracilis, the adductor longus, and the lesser saphenous branch of the right side; also the greater saphenous and adductor longus of the left side. Dr. Post has constructed some ingenious and useful modifications of instruments, and the treatment of these deformities.

An invaluable treatise on the subject has been published by Dr. Little, of London, on the nature of club foot and analogous deformities, including the treatment both with and without surgery, and in this work the young orthopedic may refer for detailed practical instructions, illustrated by numerous cases. Dr. Little has himself a series of congenital talipes, and has long practiced the operation of tenotomy on his own feet, and had only been directed by the results of Delpech's case, and the advice given by his professional brethren. Having secured the success of Stromeyer, he proceeded to Haver, and became the patient of that eminent surgeon in 1835, by whom his own deformity had been cured. Since then, during his stay on the Continent, Dr. Little has been repeating the operation on others, and on his return home he had the honor of introducing the Stromeyerian method into the British metropolis.

M. Rouvier, of Paris, and Dr. Whistler, of

London, had anticipated Dr. Little, according to the plan of the former gentleman. Mr. Wiggles having thus devoted the tendo Achillis as early as May, 1806. But Dr. Little was the first British practitioner who practiced the Stromeyerian method of cure, his first case in London being performed February 1828, 1837.

It seems, however, that Dr. Thomas Inglis, of Glasgow, as early as 1832, guided only by his sensations and his vehement desire to relieve himself from the deformity, he being afflicted with congenital talipes equinus, boldly divided the tendo Achillis of his right leg. Dr. Inglis was at that time a young man, and had not yet commenced his medical studies; of course, he rudely cut down without regard to the skin, fascia, and tendons, having no knowledge of the subject, but desperately determined to remove his lameness, even at the risk of his life. "The hemorrhage so alarmed the family that he was placed under surgical treatment, and the foot enlarged to a state of extension, the edges of the divided tendo-achil closely in contact, and he being prohibited from walking until the union was complete. No untoward circumstances delayed admission, but the deformity was, of course, unchanged. Thus he remained until 1837, when, he went to London, and placed himself under the treatment of Dr. Little, by whom the same operation was repeated on the 11th of August, and in three days, the puncture having cicatrized, Stromeyer's foot-board was applied for extension, and in a few days the foot was as much bent at the middle-joint as that of the opposite limb, and Dr. Inglis is at length perfectly cured of his deformity.

So frequently have patients suffering from club foot ascribed their deformity "to the cord behind the heel," that nothing but the imaginary danger of wounded tendons could have prevented the surgical expedient now so extensively adopted. Indeed, the current misapprehension of surgeons against cutting the tendo Achillis has often been necessary to prevent other besides Dr. Inglis from making the experiment on themselves, so cautious have they been that their deformity depended on this "cord behind the heel."

Among the varieties of cases related by Dr. Little as having been treated by him, will be found congenital and non-congenital examples, of one foot or of both feet, and existing either as *T. equinus*, *T. varus*, *T. valgus*, or *T. calcaneus*, with and without the complication of these varieties. In numerous examples of *congenital talipes* flat, we have existing in the same patient the analogous deformity of club hand, and which is found to depend on similar muscular contractions, the flexors and pronators of the hand being affected like the extensors and abductors of the foot. So, also, in all other congenital cases of club foot and club-hand, congenital squinting and congenital stammering are found to be simultaneously present, and which may be ascribed in such examples to the increase of the sympathetic, or the decrease of the voluntary motor power of the ocular and laryngeal muscles. And it is a remarkable fact, that even some cases of non-congenital club foot are complicated with squinting.

In respect to the causes of club foot, a variety of conflicting opinions exist in the profession; the most probable of which is, that it depends in all cases upon spasmodic muscular contractions, and may therefore originate from any cause capable of producing the spasm, whether

or applied before or after birth. This pathology of these deformities will explain the fact that it so often occurs after birth and at various ages, while these non-congenital examples are found to possess the same inflexible and essential peculiarities as the congenital affection, advancing often to the same grade of deformity, and removable by the same means. The better knowledge we now possess of the morbid anatomy of these deformities, and our experience as to the causality both of the congenital and non-congenital varieties, prepare us to reject many opinions as to their etiology, which have been adopted for want of these guides by those who have hitherto investigated the subject; for nothing can now be ascertained than that the cases which are known to have originated during fetal life, and those which have occurred long after birth, are identical in their nature, and are dependent on some common cause.

In regard to congenital cases, there is nothing unphilosophical in admitting the ancient opinion that a severe fright to the mother during pregnancy may be one of the sources of club foot; for a violent mental impression made upon the maternal circulation may so disturb that of the fetus as to affect the brain and spinal chord of the infant, and result in spasmodic contraction of various muscles, leading to different kinds of deformities. This theory, which ascribes the deformity to some cause resident within the organization of the fetus, is incomparably more plausible than that which ascribes it to mechanical pressure, or the entanglement of the limbs *in utero*, especially as these deformities have been so often found during early periods of fetal life, when the pressure of the liquor amnii would protect the limbs from being acted on by these mechanical causes.

The first appearance of non-congenital talipes is frequently observed during dentition, or after convalescence from some infantile disease, especially of spasmodic character. The loss of the use of the limb or limbs is at first often ascribed to paralysis or to general debility; but, as the child gains strength in every other part of the frame, one or both limbs are found to be drawn up, and we have *T. equinus*; or a turning in at the toes is observed, and *T. varus* is present; or, as in other cases, *T. valgus* or *T. calcaneus* may result. Dr. Little has observed these several forms of club foot, the history of which was preceded by infantile diseases such as are here stated. And he gives cases in which talipes has been thus originated by disturbances of the organic system of nerves, not merely in infancy, but at later periods of life, even after the age of puberty. He cites instances of hysterical young women who had previously enjoyed the perfect use of their limbs, and yet, through spasms of the gastrocnemii, and anterior and posterior tibial muscles, they have been ever after afflicted with club foot, having all the characteristics of the congenital form.

Dr. Little's doctrine is, that any cause, or other paralytic or spasmodic, by which the equilibrium between different sets of muscles that are mutually antagonists is disturbed, may produce club foot. Other disorders more or less resembling club foot are often produced by the contraction of the limbs or elevation, or by too long confinement of the limbs in a particular position, or, indeed, any agency which seriously disturbs the antagonism of the muscles. The adoption of this etiology will lead to a more rational treatment of all these

dislocations than the indiscriminate employment either of amputation or mechanical apparatus and bandaging, or both, however valuable these means may be regarded in the cases to which they are appropriate.

The plan of treatment in these non-congenital cases should be decided upon the principles of rational medicine and enlightened surgery; and such deformities call for as careful discrimination of the true pathological state as is demanded in other cases of organic or functional malformation. A case of talipes originating from paralysis of the anterior muscles of the leg, with, when it occurs after birth, precisely the same treatment as is adapted to paralytic affections in any other part of the body. Hence, when the flaccidity results from active, permanent, and involuntary contraction of the muscles of the calf, the attention of the surgeon should be directed to the central organs of the nervous system, the brain and spinal cord; or in other cases, he will find the incident and reflex functions of the nervous system which have disturbed the equilibrium of the muscles of the foot to the eklyso-poetic or other visceris, and medicate accordingly.

Dr. Little's work, because of his interesting these views at length, is the more worthy of con-

sideration. So, also, he discriminates clearly between the cases which can be cured by surgery and means alone, and those in which treatment is demanded in order to render any such apparatus available for permanent benefit. I commend for the surgical reader to his work as one which will amply repay a perusal.

Dr. Hester Gross, of Philadelphia, is generally supposed to be the practice of indiscriminate amputation in club foot, now becoming an epidemic in this country. He believes that a large majority of cases are curable by treatment alone (1841), and are carefully detected, without the aid of the knife. His instrument for the primary treatment of tarsus and talus, which is a new structure and very simple, is described and figured in a paper published in the *American Journal of the Medical Sciences* for January, 1841, in which the author has given the results of a number of cases. He contends, in his lecture on dislocations, that the system of treatment advocated by him is capable of restoring the foot to its normal shape 'with more certainty, greater ease to the patient, and in less time than any of the methods of extirpation practiced also hitherto.' He also contends that there remains less disposition to relapse. —[Editor.]

D.

[DEFORMITIES. Dr. Mutter, of Philadelphia, has the merit of having been the first in America to perform Dieffenbach's operation for removing a deformity of the mouth. (See *Amer. Jour.* for 1837, No. 40.) And in the last number of the same journal, the same surgeon reports a case of rigidity of the masseter muscle relieved by an operation. In this operation Dr. Mutter has the priority, although it has since been performed by Dr. Cammahan and Dr. Schmidt, of New-York, and also repeated in Europe. Dr. Mutter has succeeded in these cases.

In the *American Journal* for July, 1842, Dr. Mutter has published an original operation for removing a hideous deformity occasioned by a tumour, illustrated with plates, and which will be found to be highly creditable to his skill and science.

Dr. Pincoast, of Philadelphia, has successfully operated upon a number of cases of immobility of the lower jaw, with extensive adhesions following mercurial ulcerations of the cheeks and gums, and accompanied by frightful deformities.

Dr. Mutter has also reported in the *American Journal* for 1842 a case of deformed leg, in which resection of the bone was preferred to amputation, with the happiest result. —[Editor.]

[DISLOCATION. An instance of a collocated dislocation of the sternal end of the clavicle backward is related by Mr. Tyrrell. (See *St. Thomas's Hospital Reports*, vol. i., p. 263.) It was caused by the fall of a heavy mass of earth, which drove the sharp end of a pickaxe against the chest. When the finger was introduced into the wound, the great pectoral muscle was found torn from the clavicle, and the fibres could be passed as far outward as the removed process, and inward to the trachea. The greater part of the intersternous cartilage remained in its place. There was emphysema below the clavicle and over the sternum, and difficulty of

breathing. The shoulders were brought back with straps attached to a lockboard, and the bone readily resumed its place. The place was brought forward, and bound to the side. The case terminated well.

Mr. Anstey Cooper informs me that the dislocation of the os humeri on the acromion at the hospital is most readily reduced by leading the elbow, putting the foot behind the neck, and then sustaining the force and of the humerus backward.

Mr. John Mandeville has published the case of a simple and complete dislocation of the scapula from the os scapulae and clavicle, having been upon the dorsum of the latter, without interference of the relations between the two bones, and without fracture of any of these bones. (See *Dublin Jour. of Med. Science*, vol. xij., p. 225, &c.) —[C.]

[Dr. George W. Norris, of Philadelphia, has published a case of complete laceration of the knee without fracture, in which the M. and M. ligaments were involved, for which see *Amer. Jour. Med. Sciences*, vol. i., new series, p. 448.]

Dr. J. Waigon, of New-York, reports an interesting case of dislocation of the patella on its axis in the N. Y. Med. and Surg. Journal for 1841, together with observations on the case of a valvular elongation, which is also referred to in the *Cyclopaedia of Anatomy and Physiology*, published in Great Britain.

Dr. Latham reports, in the *Amer. Jour.* for 1837, a case of a tumor which could dislocate the shoulders at pleasure, and was in the habit of exercising this power of dislocation when he wished to avoid any laborious or disagreeable movement. The location was always effected downward and toward, and was readily produced by the voluntary contraction of the musculature, never by any active aid from the hand. It was in every case readily reduced in the most

way; and although he was able at once to see the fault at his work, yet, as he was directed by the surgeons who were called to him to wear it in a sling for a few days as a measure of precaution, he was wont to avail himself of this course, and thus incurs the inconvenience. This must be superadded, therefore, to the list of trivial diseases; for, although self-induced, he was not able to effect reduction without surgical assistance. The case, however, must be a very rare one, probably unique.

Dr. Gross has inserted a note, in his late Philadelphia edition of *Liver's Elements of Surgery*, on congenital luxation of the hip-joint, which, though rare in this country, has been witnessed by Druryton in twenty-six cases; and he found it to be hereditary.

Dislocations of the hip-joint, in which the head of the femur takes other directions than the four ordinarily laid down in the books, are often observed. Dr. William Parker, of New-York, relates an interesting case, in which the head of the

bone was found in the yermium. *Am. N. Y. Gazette*, vol. 4, 1841.

A NEW CASE OF LUXATION AT THE SHOULDER.

Professor Parker, of New-York, was called by Dr. K. Campbell, of Pittsfield, Mass., to see a patient who had luxated the right shoulder. He was twenty-two years old; good constitution; was at work at the time of the accident in a wheel-lathery. The luxation was produced by the handle being caught between the belt and drum while the machinery was in rapid motion. The hand was seized under the drum, being strongly yroned up to the head of the handle, seemed to have been strongly twisted; the capsular ligament was rent, and the head of the bone was left under the axilla; the continuity of the axillary ligament and the arm and forearm were lying diagonally across the thorax.

This luxation was reduced into the axilla, and then from this position the head of the bone was readily carried into place.—*Revue.*

E.

[**EAR.** Mr. Edward Cook has examined the temporal bones of five children, who died of strumous diseases of the thoracic and abdominal viscera in the Asylum for the Deaf and Dumb. In three instances, one or both ears near the seat of serofulous ulceration, affecting the tympanum and mastoid externus, with partial degeneration of the membrane tympani. In one case, the cavity of the tympanum, together with the mastoid cells, was completely filled with the thick, shaggy deposits of scirrhous, while a similar affection permeated the whole cancellated structure of the petrous bone. The ossicles of the ossicula were destroyed, but the bones themselves remained entire. In all the cases examined by Mr. Cook, the petrous portions of the temporal bones exhibited more than the usual varieties of size and shape. In some, the bone was so deformed in particular spots as barely to cover the internal cavity, while in others there was a preternatural osseous development. In one instance, the petrous part of a child twelve years old exceeded in size, hardness, and compactness of structure that of an adult. One malformation, discovered in two cases, consisted in a partial deficiency of two of the semicircular canals. Their extremities opening into the vestibule were perfect, but the central portions were imperious, or, rather, did not exist at all. In one case the scala tympani was terminated at its larger extremity by a long septum, which separated it from the tympanum, and occupied the situation of the membrane of the fenestra rotunda. With the exception of these malformations, and the serofulous affections of the tympanum already mentioned, which were probably of recent occurrence, no deviation from the healthy state could be discovered in either of the five subjects examined. The Eustachian tubes were pervious; the bones, muscles, and membranes entire and sound; the labyrinth was filled with their transparent fluid; and the auditory nerve presented no peculiarity. The chorda tympani existed in each of the cases; but the integrity of all its little filaments passing into the tympanum, and possessing a microscope for their dissection,

could not be vouched for. (*E. Cook in Med. Chir. Trans.*, vol. 41, p. 152.) In a case discussed by Mr. Daurympie, the aqueduct of the vestibule was large enough to admit a small probe; and, in a later examination of the ear of a child who died in the Asylum for the Deaf and Dumb, Mr. Cook could find no vestige of the fenestra rotunda on either side, the whole situation of the membrane being occupied by solid tissue. The temporal bones were accordingly large, though soft and spongy. The canals were extraordinarily capacious, and the Eustachian tubes three or four times larger than common. On one side, the aqueduct of the vestibule readily allowed the passage of a large needle, but on the other side the canal could not be traced through the bone, although its two extremities were more than usually expanded. In one tympanum separation had taken place. (*E. Cook, ib.*)—C.]

In the United States there have been few surgeons who have distinguished themselves by their success in the treatment of diseases of the ear. Deafness is a less frequent disease in this country than in Europe, but cases are nevertheless sufficiently numerous to deprive us of any justifiable excuse for the neglect which this subject has received from American surgeons. It is true that the reputation here of the methods of Krüner and other foreign writers have been much less successful than those transatlantic surgeons would lead us to hope. Still, however, there have been instances of similar success to those they report, and in sufficient number to encourage future efforts.

Dr. Cohen, of Baltimore, and Dr. Dix, of Boston, have for several years directed their particular attention to diseases of the internal ear, and in the investigation of the abnormal condition of the tympanum and Eustachian tube in cases of deafness. These gentlemen have employed condensing apparatus for administering the air directly through the Eustachian tube, after the plan of Krüner and others. By the air and also the water douche, these gentlemen have acquired great skill in the diagnosis and treatment of ob-

strations in the tube and upon the tympanum. For the treatment of nervous deafness, the douche of acetous and sulphuric ether has in many instances been successful, but the proportion of cases benefited by the douche in this country is very much less than stated by Keen.

There is reason to believe that, in minor affections of the ear, accompanied by temporary deafness, very great mischief is often done by the earpick, employed empirically by the patient himself. The little finger on each hand has been called the ear finger, because of its adaptation to the office of clearing out obstructions in the external ear; nor should any smaller or round instrument ever be introduced except by a surgeon, who has his eye to guide him, aided by a speculum auris. The introduction of ear-picks and pins into the external ear by patients is among the frequent causes of irreparable deafness. So, also, stuffing the ear with cotton, either with or without oil and other medicaments, is to be deprecated by all who would not hazard the loss of this important sense of hearing. The fibres of the eardrum often become interperforated with the morbid secretions in the meatus, and find their way to the tympanum, and are not easily removed. Hence wool should be substituted in such cases, as not liable to this objection.

In the treatment of furuncle, however, which is often genuine otitis, and requires active depletion, local and general, suitable discrimination is demanded. But in those cases depending on a local morbid sensibility, without evident inflammation, it is common to stuff into the meatus a plug of cotton or wool moistened with oil, with or without a mixture of iodoform. This practice, when not absolutely ignorant, is never useful. If it be expected to reach the membrana tympani with the medicated oil, it should be poured into the external ear until it is full, which may be known by the cessation of the escape of bubbles of air from the surface of the oil after the ear is filled. A piece of wool may then be introduced into the meatus. This method of introducing olive oil, or the oil of almonds, into the ear, will often relieve deafness, when ascribed to be dependent on hardened cerumen. The injection of the oil, or of warm water, which is better, is greatly preferable.

In those examples of deafness arising from a deficiency or absence of cerumen, and, indeed, in cases of serous deafness, and all others in which there is a want of sensibility in the organ, I have found early and permanent benefit by the kerosene mixed with oil of almonds, in the proportion of one part of the former to three of the latter. This mixture should be introduced upon a cannula held perpendicularly to the tympanum, and, with suitable discrimination in the cases, will never do mischief, and often effect a cure. The reader will find in the article on this subject in the Dictionary many valuable matters, to which I have here prefixed what is important in Mr. Cooper's last edition.

Dr. Murray, of Cincinnati, has operated, by perforating the membrane of the tympanum, for deafness, accompanied by a closure of the Eustachian tube, in six cases. Only one of these patients was restored by the operation. In the other five cases, the deafness, in all probability, was independent of the closure of the tube, although this was not ascertained.—[Rex.]

[ECTROPIUM. Jussieu describes a plan, which has been adopted by Jaeger himself, and was practised a hundred years ago by Platani

(*Ann. Chir.*, 4 582), and even recommended a century before this author by our countryman Bonister. Heister and Dierle state a still more circumstantially. (See *Mémoires sur les Op. de l'oeil*, vol. 2, p. 782.) It consists in detaching the eyelid from the cheek, by a superficial ridge, at every point excepting the angles, by introducing a sharp-pointed, double-edged knife through the conjunctival surface, near the nose angle, bringing it out through the skin, and conveying it across to the outer angle. A portion of the thickened conjunctiva, or a triangular piece of the lid, may be first removed, if necessary. The detached lid is then to be accurately fixed in contact with the globe, and the skin of the cheek drawn towards the eye, and kept in that position with adhesive plaster, compresses, and bandage. (Hendrick, *op. cit.* p. 695.) Dieffenbach makes an incision through the skin and conjunctiva nearly parallel to the edge of the lower lid, beginning two or three lines from the angle, and terminating at the same distance from the other. It is one line from the edge of the lid at its two ends, and two or three lines in the middle. He turns up the small flap of skin, and dissects through the lid to the conjunctiva, which he divides to the extent of the external wound. With a hook he draws the external margin of the divided conjunctiva into the wound of the skin, and keeps it and the ligaments together with sutures. (See *Clin. Chirurgie*, par Dr. W. Dieffenbach, *Zeitschr. Fests.*, 4, tom 1, p. 118, fig. 127, Berlin, 1837, also *Archiv. Anat.*—C.)

[EMBRYOTOMY. In the Philadelphia Practice of Midwifery, by Dr. Meigs, an unusual case is reported, in which the practitioner employed a peculiar trocar and forceps for the destruction of the foetus, which the surgical reader will find to be of great practical importance. This earlier patient has been twice referred to the Gynaecian section by Dr. Gibbes from Dr. Meigs's operation of embryotomy, and the case will be found under the appropriate head in this Appendix.—Rex.]

[EMPHYEMA. In the Amer. Journal of Med. Sciences, Dr. Pennington, of Philadelphia, has published a paper on emphysema, in which he describes a new plan of treatment, the success of which is the case reported is the last proof of its utility.—Rex.]

[EPISIORAPHY. Professor Gittings has published a monograph on the subject of entosis in the external labium of the female, in which may be found in the American Journal for 1845. Since then the operation has frequently been reported in this country with success in proclivous cases. Dr. Ewe and Dr. Dugas, of Georgia, have both practised it successfully.—Rex.]

[EPISPADIAS. Dr. Matter has cured two cases of this disease by the urethral operation. Dr. Meigs, of Virginia, has lately published a paper on this malformation, including hypospadias, which is of an eminently practical character. It may be found in the Amer. Journal of Med. Sciences for July, 1842.—Rex.]

[ERYSIPELAS. The application of the nitrate of silver as a substance, or in the form of a lotion, so as to blacken the part, appears to have considerable power as a means of checking the peristaltic action of the vessels in which erysipelas inflammation depends. It results upon the effusion of serosity in the cellular tissue, and if applied beyond the erysipelas, will have an ob-

stable to its spreading in any particular direction. By forming a black line with it, the inflammation may thus be kept from running up the neck to the face and head. The use of nitrate of silver in erysipelas has been particularly insisted upon by Mr. Higginbottom. (*On the Use of Nitrate of Silver*.) In the early stages of erysipelas I have often employed it with advantage in the North London Hospital; but it should not be continued too long; for when it fails to lessen the distension of the cellular tissue with serosity, the fluid should be discharged by puncture or incision. Mr. Higginbottom directs the part to be first washed with soap and water, and then dried. The inflamed and surrounding skin is then to be moistened, and the nitrate of silver passed over it once, twice, or thrice; and more frequently, if rapid venification be required. The part is then to be exposed to the air and kept cool.

Of the good effect of mercurial ointment as an application to erysipelas, I cannot speak from experience. Dr. McDowell has tried tartrated mercuric, and makes a favourable report of it. In Mercer's Hospital, it was found also to have considerable power in checking the disease. Two, three, or four applications usually sufficed, with other means. In most instances, the patients were cured. (*See Dublin Lect. of Med. Science*, p. 6.—C.)

(EXCISION OF BONES. Dr. Thomas Harris, of Philadelphia, has excised the elbow-joint for cancer for the first time in America, and with entire success. Dr. Warren, of Boston, has recently repeated this operation with the like result. Dr. Mayer, of Philadelphia, has successfully performed a similar operation, by excising the lower extremity of the humerus and the upper extremity of the ulna for cancer. He professes the incisions of White in all such cases.

Dr. Pincoast, of Philadelphia, has had extensive experience in the excision of bones. He has lately removed the elbow-joint six times, following the plan of Moreau and Syme; and he has excised the upper radio-carpal joint, removing all the articular faces of the three bones, employing Barrow's saw and Liston's forceps. He has also cut out the metacarpophalangeal joint of the great toe for cancer. In all these operations he has had complete success.

In the eighth volume of the North Am. Med. and Surg. Journal, Dr. Allan Giddens relates a case in which he removed portions of three dorsal vertebrae for the relief of paralysis from fracture, and with partial success. The young man had been thrown from a horse, and he was almost universally paralyzed from the moment of the accident. At first the case was regarded as one of dislocation of the vertebra; but Dr. Dudley discovered a fracture after in-

king an incision down to the bone, the base of the spinous process being driven in upon the spinal marrow. The operation was performed by Dr. Giddens for the purpose of removing the pressure from the root, and he excised a part of the spinous processes of two vertebrae, half of the third, and the whole of the fourth of the dorsal vertebrae. The sensation partially returned, and for a time very great hopes were entertained, but ultimately the patient died, life having been protracted, however, for several months, and great relief meanwhile having been afforded to the paralysis. Had not the operation been so long delayed, there is good reason to believe it would have completely succeeded.

Dr. Norris, of Philadelphia, excised the astragalus in a case of simple luxation of this bone, and has published critical remarks upon the practice in the *Amer. Jour.*, vol. xx., No. 49. In the article on Dislocation in this Dictionary, it will be seen that Dupuytren performed this operation in 1828; but numerous cases are on record which were cured by reduction, and others in which no permanent lameness resulted, even when it was found to be irreducible. The necessity for the excision in any case must be rare, but, indeed, such examples of luxation will be found but very seldom.—Russet.]

(EYE. Dr. J. C. Warren first described a case of accidental dislocation of the crystalline lens in the *New-England Med. Jour.* for 1811; and he also, in the same journal, called the attention of the profession to a rheumatic inflammation of the eye, now universally recognised, but until then very little was known of its diagnosis.

Professor Dugès, of Georgia, relates a number of morbid conditions of the eye, in which it became necessary to destroy the organ. This he effected by passing a tomaculum through the cornea, and opening it with the straight bistoury, without touching the sclerotics. There can be little doubt that the removal of the cornea in this way should be preferred to the excision of the eyeball, which in many cases has been unsuccessfully resorted to. Dr. Dugès seems to have used suitable dissection in his cases; and the eye, being lost, the deformity resulting from his operation was greatly diminished, while the removal of the cornea by his method is attended with no danger. No untoward symptoms followed in any of his cases.

Dr. W. A. McDowell, of Louisville, Kentucky, has published in the *Western Journal* a paper on the eye, containing surgical and pathological observations of great practical value. I regret that my limits will permit me only to make this reference to an article which possesses both novelty and merit.—Russet.]

F.

(FINGERS, FREQUENT CONTRACTION OF.

Baron Dupuytren has made some interesting observations on this affection, in which each of the fingers, but especially the ring-finger, is affected. Most of the individuals who have this infirmity have been accustomed to make efforts with the palm of the hand, and to handle bodies of great hardness. When a tendency to the complaint begins, some difficulty is experienced in extending

the fingers, and the ring-finger soon becomes contracted; the carpal phalanx being first implicated, and the others afterward inclining in the same direction. In this stage, the flexion of the two adjacent fingers becomes much checked, but no lameness is yet perceptible in front of, and around the root on the palmar side of the ring-finger. Its second and third phalanges are straight and movable; the first is bent more or less to a right angle, and is movable on the metacarpal

tenes; but it cannot be put into the straight position by the most violent efforts. Dupuytren refers to a case in which a trial was made to cure the paresthesia by means of the application of different weights, which were increased up to 120 pounds without the flexion being removed.

When the ring-finger has become very much bent, the skin is thrown into folds, the convexity of which is towards the fingers, and the convexity towards the radio-carpal articulation. On first inspection, one might suppose the skin to be diseased; but this is not the case. A tense cord is felt on the palmar side of the finger; it extends towards the first phalanx, and may be traced to the upper part of the palm. When the finger is bent, it disappears almost entirely. If attempts be made to extend the fingers, the tendon of the palmaris brevis is felt to move, and the tension is propagated to the upper part of the palmar aponeurosis. The patient is unable to grasp large bodies; and if he try to take hold of them more forcibly, or an endeavor is made to extend the fingers, he experiences severe pain. The course of this disease were formerly referred either to thickening and contraction of the skin, or to the muscles, disease of the flexor tendons or that of the fibrous sheaths, or some change in the articular surfaces and lateral ligaments. All was uncertainty, when Dupuytren had an opportunity of dissecting a hand in which this anomaly existed. A drawing having been first made of it, the incisions were removed from the palm and palmar aspect of the finger, after which the folds and wrinkles had entirely disappeared. From this it was clear that the disorder did not depend upon the state of the skin. As soon as the palmar fascia had been exposed, it was found to be thickened, contracted, and shortened, and that from its inferior part roots or bands proceeded to the sides of the affected finger. On an attempt being made to straighten the finger, M. Dupuytren observed that the fascia became tense. He then divided the prolongations of it extending to the sides of the finger. The contraction ceased immediately, and the finger assumed a very slightly bent position. In fact, the disease was ascertained to be owing to the extreme tension of the palmar fascia, brought on by a contraction of the palm; or the long continued pressure of hard substances upon it. The plan of cure adopted by M. Dupuytren consisted in making a transverse incision, about ten lines in length, over the radio-carpal-phalangean joint of the ring-finger. The skin was first divided, and then the palmar fascia. As soon as this had been done, the finger became straight, and could be extended almost as readily as in the natural state. After the operation, the hand was fixed with a bandage upon a piece of pasteboard for a few weeks, and the fingers kept extended. In one case M. Dupuytren made semicircular incisions—one at the base of the ring-finger, in order to divide the two digital and lateral prolongations of the palmar fascia with this finger; the other as high and a quarter from the first, in the palm of the hand, for the purpose of dividing the digital prolongation at the root, and thus detaching it from the palmar fascia. (See Dupuytren, *Chin. Clin.*, t. i., art. 1.)

In a lecture delivered subsequently to the preceding observations, M. Dupuytren adverts to diseases of the fingers arising from other causes; as a previous wound of the palm known by the name of *ulceration in the foundation of the phalanges* by himself, and characterized with the kind of cord observed when the palmar fascia is implicated,

and a division of the extreme tendons with a cutting instrument, which parts, not being united again, leave the flexors without any antagonists. A contracted wound, producing sloughing of the skin of the palm, may have the same result, if its edges be suffered to be drawn together, instead of cicatrization being completed by the formation of a new cutaneous texture. (See *Chin. Clin.*, t. i., p. 261.) Bands of the palm are frequently followed by this deformity when the pressure in dissection is neglected. Among other causes of permanent flexion, M. Dupuytren notices deformity of the articular surfaces of the phalanges, produced by the long-continued position of the fingers in certain employments, as in bookbinding, tailors, &c.; by wounds of the flexor tendons, at their displacement, in consequence of having been extensively laid open for the cure of whitlow. The wound of a joint may be another cause of contraction of the finger; and a spasm of the flexor muscles may lead to the same consequence. M. Dupuytren's observations on this subject seem to me equally original and valuable. The toes are also liable to a contraction, dependent upon a strain of the plantar fascia corresponding to that of the palm.

I have introduced the opinion of Dupuytren on the origin of such contractures, viz. that the bands hindering the extension of the finger were produced by a permanent contraction of portions of the palmar fascia. The same views are adopted by the late Mr. Henry Cline, and as would appear from an extract taken from his lectures, and published in one of the volumes of the *Lancet Medical Gazette*, even prior to the period when Dupuytren taught the contracting nature of the fascia. The latter had also anticipated the latter as the practice naturally dictated by such contemplation of the cause of the deformity. Mr. Goyrand and Velpeau, however, dissent to the explanation of the subject given by Dupuytren, because the digital slips of the palmar fascia originate in, and are fixed to the base and sides of the root of each finger, while the diseased band is situated in the middle of the finger, and is often prolonged to the third phalanx. They look, therefore, in ascribing this contraction to the transformation of a part of the substance of cellular tissue in front of the phalangeal and fibrous band. M. Sanson also infers that this is the ordinary case, and that the contraction of the palmar fascia is an exception. The treatment recommended by M. Goyrand consists in making a dermiform incision through the skin, over each hand, when extended, to separate the lips of the wound, to detach the fibrous contractile dissection, and to run across these when thus detached from their attachments. (See *Gaz. Méd.*, No. xxxi and xxxv., Aug. 1825.) Sir Ashley Cooper passes a narrow knife under the cord, whether cut through without dividing the skin. —C.]

PISTULA. Thus the presence of a dead piece of bone or of a foreign body often keeps up suppuration, and the fluids effused by the discharge of the matter. When an abscess forms near the anus, the matter becomes, and the fist is determined by the action of the sphincter—a *fistula* is said to be produced. Sometimes a fistula is produced by the continual discharge of some healthy excretion through a wound or wound exemplified in salivary, lachrymal, and urinary ducts. The lining of all fistulae may assume the appearance of certain morbid conditions, though follicles and villi, like those of the

anal canal, have never been observed in it. As Anal sinuses, when most perfectly organized, it can only be compared to the most simple mucous membranes, such as those of the ureters, or lesser branches of the hepatic ducts. The lining of fistula, like mucous membranes in general, when not inflamed, is pale and of a grayish colour; but if affected with acute or chronic inflammation, it exhibits the same shades of crimson and redness seen in a mucous texture. It is also liable to certain affections, which remain placed exclusively to nervous membranes, as fungous growths, callosities, &c. The cellular tissue connected with the lining of fistula may become thickened, indurated, and sometimes give rise to the strabulous cellular tissue in general. Finally, just as adhesions occur take place between the different portions of a surface lined by a mucous membrane, unless a solution of continuity has taken place in it, so the sides of a fistula cannot adhere together, and its cavity is obliterated, unless measures be made to bring the textures and the membrane-like investment of it into contact. (See *Anal. Proct. Lib. Philad.* t. i, p. 261.)—(C.)

Dr. Hayward, of Boston, has performed an operation for vesico-vaginal fistula, which, from its originality and success, is worthy of attention, as well as from its being the first instance in which this disgusting malady has been cured in this country. It may be found described in the *Boston Med. and Surg. Journal* for 1839.

Dr. Mutter, of Philadelphia, has a valuable paper on the different operations for fistula in situ, in the thirty-seventh number of the *Amer. Journ. of Med. Science* for 1834.

Dr. J. Ryan Barton has cured a formidable case of salivary fistula by a modification of the same, and making an artificial opening into the mouth from the duct for its passage by a new style.

Dr. Mutter has cured three out of five cases upon which he has operated for vesico-vaginal fistula. The operation he proposes will be described in his forthcoming work on Surgery, to which I am obliged to refer.

Dr. Paronast, of Philadelphia, has had singular success in treating fistula in perineo consequent upon urethral stricture. In some of his cases there were many fistulous openings, with callous thickening of the subcutaneous layers of the scrotum, perineum, and anus, greatly resembling the anatomy of the parts complicated, in some cases, with enlargement and disorganization of the prostate gland. His plan is to introduce a silver catheter down the stricture, open the edges of the perineum near to the anterior margin of the phrethrum ure, and from this point make a transverse incision running a little obliquely backward, of an inch or more in extent, towards the tubercle of the urethra. He then readily reaches the membranous part of the urethra. In the incision he has never found it necessary to apply a ligature to a large vessel. He then cuts through the stricture at the end of the catheter into the membranous part of the urethra on the plan of Mr. Shaw. He now directs the patient to urinate, and thus discovers the passage to the bladder through the wound, and introduces along the membranous portion of the urethra a silver-pointed silver director, made large for the purpose, along which he carries the end of the silver catheter till it reaches the bladder. The soft parts are then brought over it by suture, and in most cases he is able to effect union by the first intention. Dr. Paronast does not

remove the catheter for six or seven days, when he easily and safely re-introduces another. He has tried Mr. C. Bell's plan, by pushing in a bougie to first in the prostate, and cutting downwards, forward, and outwards, but as there is not retention of urine sufficient to keep the membranous portion of the urethra dilated, this method does not answer.

In the twenty-sixth volume of the *Boston Med. and Surg. Journal*, Dr. E. H. Daxon, of New-York, reports an interesting case of fistula in perineo and vaginal anus consisting in the same individual, and resulting from an abscess in the prostate gland.

Dr. J. Ryan Barton has published in the *Amer. Journ.* for 1840 the particulars of a successful operation he performed for the cure of a vesico-vaginal fistula, which is creditable to his skill and talents.

Professor Parker, of New-York, in operating for stricture lachrymalis, has introduced an improvement, by employing a transverse-bladed knife for the incision, upon the side of which is a groove, so that it continues in itself the advantage both of the knife and director. The incision being made with this knife in the usual manner, it is easy to pass the style along the groove while the knife remains and thus complete the operation with greater facility than by the ordinary method. The same surgeon has also constructed a bistoury with a similar groove on its side as a director, along which a probe may be passed, and which is well adapted for exploring pyramids, as in chronic fistulas, and in searching for foreign bodies.

FISTULA IN ANO.

In the notice of the operation for this disease, Mr. Cooper makes no mention of Dr. Physick's sheathed bistoury, or the instrument of Critchshank, but still directs the use of the director and probe-pointed bistoury. Now, where there is no opening between the gut and sinus, as in incomplete fistula, it is necessary to make one, and the probe-pointed instrument will not answer in these cases. Dr. Physick's sharp-pointed bistoury, with a silver sheath covering both its point and cutting edge, can be introduced in the sinus or the gut until it reaches the point at which the one is to be opened into the other, and then by removing the sheath, the puncture and incision are both easy. Mr. Critchshank's bistoury has a movable spout, which can be protruded or retracted at pleasure, and infuses the want of retention as the instrument of Dr. Physick, by combining in itself both the sharp and the probe points. The latter is preferable, however, because its sheath conceals the cutting edge, and prevents any wound during its introduction.

For the operation for fistula in situ by the linear, in the cases in which this is preferred, Dr. Gibson has constructed an instrument which possesses many advantages, and may be found described in his late work.

Dr. Keil, of Georgia, has had uniform success in curing this disease by incision, he only divides the wound once to prevent adhesion, and afterward relies upon suture and the daily eversion of the perianth.—(Bacon.)

[FRACTURES.—Dr. J. Ryan Barton, of Philadelphia, has introduced into the Pennsylvania Hospital the instrument of compound instrument of an leg by amputation, which has been ever since adopted in that institution with the most satisfactory results. It is described in the *Amer.*

Journal, new series, vol. 1, p. 327, and also in Dr. Norris's edition of *Labor*. The limb is fixed in a fracture-box on a bed of dry straw, and simply surrounded and enveloped in the same material. This dressing is soft and grateful to the patient, keeps up equable and sufficient pressure, while the brain expands when unobscured by hemorrhage, and the pressure is thus attenuated. It may be removed and changed by a splint or syringe, and again applied as often as it may be called for, and without disturbing the limb or reflecting pain. In hot weather, this dressing of clean straw is preferred by Dr. Norris as possessing great advantages by absorbing the perspiration and hemorrhages, and preventing the fever which is apt to attend such cases, and taint the ward of the hospital.

Dr. W. H. Van Buren has a paper in the *Amer. Journal* for 1840, on the immovable apparatus, and its therapeutic application to fractures, and various other surgical diseases, which possesses great merit.

Dr. Mort has treated a number of cases in which fracture of the cervix femoris had occurred, and has uniformly found that, in early and mobile life, union may be expected, even when the fracture is within the capsular ligament. In aged persons, he has never known the bone to unite after such an injury.

In fractures of the femur, he prefers the double-splinted plane in all cases, even when the cervix is broken, and he recommends this plan after trying Pott's, Desault's, Pirovich's, and Jolyer's methods as repeated examples. He finds that the best union can be made by the fixed position, and it is most comfortable to the patient.

Dr. Mort has been very successful in the treatment of ununited fractures by the introduction of a seton, and has three times employed it in the thigh with complete success. He takes this course whenever time, fire, and irritating the ends of the bones by walking in splints do not effect consolidation.

In one case of ununited humerus, when the fracture-ends were at a little distance from each other, and when the seton had been worn for six months without benefit, he succeeded, by caustics. In other cases, after failing to succeed by excision in ununited fractures of the arm, he has subsequently cured the patient by the seton, and in the humerus has found this remedy almost uniformly successful.

In three cases in which the fractured tibia had failed to unite, he has effected a cure by the seton, and one of these was of more than twelve months' standing. In another example, after complete union had been effected by the seton, the patient fell and fractured the bone at the same point. On subjecting him to the ordinary confinement, the cure was as early obtained as though it had been a primary fracture.

Dr. Mort directs that the seton, in these cases should be passed directly between the ends of the bones; for if it merely pass beside the fractured ends, even though in contact, it will not succeed; and hence, when the bones are closely united by ligament or other tissue, a passage must be bored or filed through, to admit the passage of the seton. In general, the time for continuing the seton will be from one to two months, though occasionally a longer time is required. So soon as union has commenced, which is known by the firmness acquired by the limb, Dr. Mort continues the withdrawal of the seton by removing it about every two or three days,

and by the time all are thus removed, the cure is found to be complete.

Professor Parke, of New-York, has treated successfully a case of fracture of the cervix femoris within the capsular ligament. He employed long splints. It was in a female at 60, who had enjoyed excellent health. The limb was but little swelled, and the motion in the joint but slightly impaired. The patient having recovered, the femur has been observed, and exhibits complete osseous union within the capsule. The bone and its fellow are presented in the museum of the College of Physicians and Surgeons, New-York. I have witnessed two cases of a similar result, in which the seat of the fracture was entirely within the capsular ligament; and though both patients are still living, the evidence of osseous union are conclusive. Neither of them was so far advanced in life as Dr. Parke's case, one of them being 40, and the other 52 years of age.

Dr. J. C. Warren has treated 20 fractures of the cervix femoris by the fixed position, and he reports 20 cases of success, a promise he fulfills general experience, and argues well for his method, whether these fractures were within or without the capsular ligament.

For twenty years he reports having treated fractured thighs with great success, employing extension and counter-extension by means of Desault's apparatus improved.

Dr. Isaac Parish, of Philadelphia, has cured a case of ununited fracture of the end of the tibia. (*See Amer. Journal for August, 1831.*)

Dr. Ewe, of Georgia, has used the immovable apparatus of Barton and Velpeux in more than 20 cases of fracture and sprains of the wrist and ankle, with the most gratifying results. He fixes the distal end, after having tried band and starch often enough to judge of their comparative merits.

Dr. J. Ross Barton has met with fractures of the os calcis, in which the fragment is much the length Achilles was stretched and finally drawn up by the contraction of the gastrocnemii. The foot being extended permanently by bandages, an osseous union of the fragments has been obtained in three cases, and though the osseous fragment is prominent, and the tendon shortened to correspond, the patients have recovered without detriment to the motions of the foot.

Dr. George W. Norris, of Philadelphia, reports a case of ununited fracture of the humerus of four years standing, cured by the application of caustic potash, in the *Amer. Journal*, vol. xxii, p. 288. The same surgeon has published a valuable paper on the occurrence of non-union after fractures, its causes and treatment. It may be found in the same journal, vol. vi, No. 5, new series, 1842.

Dr. Nathan R. Smith, of Baltimore, has invented an instrument for fractures of the thigh and leg, which is found by experience to possess extraordinary advantages, especially in the management of bad cases. It is portable, and adapted to the straight or flexed position of the limb, effecting extension and counter-extension to any desirable extent, and he has availed himself of the advantages derived from extending the limb since 1827, and for which his *apparatus* is acknowledged. I regret that my limits will not allow me full detail of the points of merit which Dr. Smith's instrument possesses, but which demands under it expense to any and every other, and that, when

ever it is known, this apparatus is preferred to any other.

Dr. George Fox, of Philadelphia, introduced into the Pennsylvania Hospital, in the year 1828, an apparatus for fractured clavicle, which is described minutely in Dr. Norris's edition of *Lancet's Practical Surgery*, and which is every way preferable to Desault's. Indeed, to this latter there are many and forcible objections, by reason of which it is but rarely applied in America.

Dr. J. S. Heard, of New-York, has published in the *New-York Med. and Surg. Journ.* for October, 1830, a report of cases of untreated fracture treated at the New-York Hospital. In this report, the practice introduced by Dr. J. Keeney Rodgers, of New-York, is illustrated by a number of cases all of which were completely successful.

Dr. Rodgers was led to adopt this course by having a case under his care which had resisted several modes of treatment, including two trials of the seton. Having restored the ends of the bone by extension, he found that the fragments were separated from each other an inch and a half, and it appeared impossible to bring the ends into contact. He then drilled a hole into the medullary cavity through the shell of each end, and passed a silver wire through these holes; and, having then engaged the fragments, the ends of the wire were drawn through a canula which remained in the wound. He thus secured firm osseous union, and Doctors Mist and Cheever have since then repeated this method of treating bad cases with entire success. Mr. Liston and other surgeons, some of them in our own country, have condemned this practice; but as the only cases in which it has been tried have been unfavorable examples, and to which none of the other methods were adapted, some of them having been tested in vain, and as every case has succeeded, the merit of the operation is unquestionable. It is a modification of Mr. White's operation, and will succeed when this fails.—[Russe.]

[FRAGILITAS OSSIUM. For the following cases, detailed at length, reference may be had to Dr. Gibson's late work.

The boy spoken of by Mr. Cooper, in the Dic-

tionary, was a patient of Dr. Gibson, after having twenty-four fractures of different bones, has since deceased, by reason of a partial dislocation of the first and second vertebrae of the neck, after an illness of fourteen weeks.

Dr. Metzger, of Virginia, reports the case of a citizen of Petersburg, Virginia, whose tenderness of the bones was so great that he frequently fractured the humeri, radius, ulna, and clavicles in giving blows, he being habitually pugnacious. Dr. Metzger states that the lady, Frank, and her mother have been broken in his case several times from a sudden twist of the body, and from efforts to save himself from falls. His thick bones have been broken when attempting to get on horseback, and his ribs have been fractured from equally slight causes. He often said that he believed he could break the bones of the forearm by pressing them between the thumb and forefinger. So frequent were these accidents, that his domestics became expert bone-setters, and frequently managed his fractures. His recoveries were very rapid, amputation being readily effected, and very seldom was it necessary to confine him longer than three weeks after either of his fractures.

Dr. Nikison reports a case in which muscular action was of itself sufficient to fracture the bones, those of both arms above the elbow having been broken during a fit. Dr. Herdy, who attended the same patient, testifies that his bones were frequently broken by slight exertion, and in all cases they speedily reunited.

Dr. Goodard has a patient whose bones have been broken fourteen times, though now only twenty years old, and had fractured his thigh three times before he was four years of age, by falling from a step six inches high. The tenderness of the bones was a family complaint in this instance, for his mother had her thigh-bones broken six times; while her brother, at thirteen years old, had suffered nine fractures of the thigh, and two of the arm, besides having one of his hip-joints dislocated. These persons are short of stature, and have small bones, but in other respects have good health.—[Russe.]

G.

[GANGLION. Dr. Eyn, of Georgia, has had extensive experience in the treatment of these tumors, and after trying incision, extirpation, and puncture, prefers the method of acupuncture, as recommended by Velpeau, and afterward relying on pressure for their radical removal. The use of the needles is found to give very little pain.—[Russe.]

[GANGRENOPSIS. In the *American Medical Recorder* for July, 1827, Dr. Jackson, of Northumberland, has published a paper describing a number of cases, with remarks on a disease of children, which he proposes to call gangrenopsis; and in the *Amer. Journ. of the Med. and Phys. Sciences*, vol. v., Dr. Witber has furnished a detail of several interesting cases of this gangrenous erosion of the cheek. Dr. W. has had the opportunity of witnessing five instances in the course of two or three years; three of the middle kind, and one of the most severe form, growing to the power of Burns. Case 4 being the most minutely described, I shall here insert

it, as a suitable appendix to my article on cancer of the jaws of children. "This case occurred in September, 1825, in a little girl 10 years old. It entered upon typhus, in which diarrhoea had been a troublesome symptom. About the fourteenth day, when the fever was apparently beginning to abate, she complained of a feeling of soreness and pain in the left cheek, not far from the angle of the mouth. The part was slightly swollen, somewhat hard, and reddish, like the commencement of a boil. Vesicles impregnated with benzoate was applied, and the soreness disappeared, though the swelling continued, being, however, less hard and rather more diffuse. A day or two after aphthae appeared in the mouth and fauces, for which a gargle of diluted nitric acid was employed. She complained, however, of the cheek being hotter and worse, and the swelling had evidently increased. On the inside of the cheek it protruded in a ridge between the teeth. Lead-water was used externally as a constant application, in addition to the occasional use of the

liniment above mentioned, and the inside of the mouth was frequently washed with honey, medicated with tannic acid; small quantities of wine were given, and one fourth of a grain of sulphate of quinine three a day; also small doses of Dover's powder to regulate the bowels, still rather too loose, and to procure sufficient rest. The cheek, nevertheless, continued to swell, and the mouth became very foul. The aphthæ disappeared in a day or two; but upon the most prominent part of the internal swelling of the cheek was a kind of fatty protuberance or blister, seemingly beneath the whole thickness of the internal integument, which over the swelling was opaque, and of a dirty white colour. This broke the same evening, discharging a small quantity of red fluid, and leaving a sloughing appearance of its membranous covering. It was repeatedly touched during the night and the following day with a strong preparation of mercuric and red honey, sufficiently strong to corrode the sloughing membrane, and make it settle down below the level of the surrounding parts. This, it was hoped, would put a check to the diseased action, and cause the slough to separate. Notwithstanding, it continued to increase during the subsequent night, and on the next morning had nearly reached the angle of the mouth, which looked dusky, and approached to a state of gangrene.

An eminent practitioner from a distance met me in consultation this morning, and advised cauterizing the protrusion with charcoal over the cheek, a small blister externally over the angle of the mouth, and one on the inside of the cheek, of a size sufficient to cover the slough and the surrounding solid edges, while the internal swellings were continued to increase down. The disease, however, proceeded with relaxed rapidity. Gangrene in undisturbed thickness passed in a few hours across the external blister, and at the same time came through the cheek, opposite to the point on the inside first attacked. In spite of the assiduous application of the poultices, these spots spread so as to enclose in the course of the night, and by the next morning involved most of the protruded portion of the cheek. The case was now deemed hopeless, and dissolution was soon expected. The fever being excessive, with a view to lessen it the part was covered with a cloth wet with a solution of the chloroform line (bleaching powder). This lessened the rapid spreading of the gangrene so much, that for hours it seemed almost entirely stationary, but did not become wholly so, though it progressed very slowly till it had covered the whole of the swelling existing at the commencement, reaching almost to the lower eyelid, over the membranous part of the nose of the same side, the upper two thirds of the lip, and half of the chin, including all the cheek down to below the under edge of the lower jaw, and backward nearly to the ear. The parts were completely sphacelated, and had nearly separated; when, at the expiration of twelve days from the first appearance of danger, the little patient died. All the peculiar symptoms of the fever had gradually subsided long before her death.

I have had several opportunities of examining this dreadful disease, but in all the cases I saw, it could be traced to the injudicious use of mercury. In two of them the whole cheek sloughed off, leaving the alveolar bones and the internal structure of the throat exposed, before they terminated fatally.—BRACK.]

[GUMS, INFLAMMATION AND ABSCESS OF.] *Gummat Period.* Inflammation of the gums mostly arises from the irritation of carious teeth, but sometimes from excess of a part of the alveolar process, or from the splintering of it occasioned by the extraction of a bad tooth. Sometimes it originates from exposure to cold, and in other instances from mechanical irritation. When the inflammation, arising from the irritation of a decayed tooth, cold, and some other causes, proceeds to suppuration, the case is then an abscess, here termed a *gummat*. The treatment consists in making an early incision for the discharge of the matter, and, after the subsidence of the inflammation, in extracting any bad teeth concerned in keeping up irritation. The abscess is to be frequently cleaned with an antiseptic gargle. If a fistula form in the gums, it is to be freely divided, and touched with the nitrate of silver, care being taken, however, before reaching to this measure, to remove any carious teeth splinter, or dead portion of bone, which latter proceedings will generally suppress all tendency for forming open the fistula.—C.]

[GUMS, TUMOURS OF.] A very common disease is a thickening of the gums at some particular point, which grows on the form of an excrescence, and generally assumes a hard, bony nature. Some of these swellings are connected with the penetrating of bone, and are disposed to acquire a malignant character; frequently, after they have attained a certain age, the neighbouring part of the bone becomes altered and softened. Other tumours of the gums are merely excrescences from the fibrovascular texture of these parts, not penetrating deeply, not connected with the bone, periosteum, nor sockets of the teeth, and not malignant. The excrescence of the gum, facial, venous glands, is of very different character in size and cases; but, in many instances of the gums, apparently trivial at first, become fatal diseases in the end, if neglected in their beginning, the rule in surgery is to attempt their eradication before they have made considerable progress.

On this subject Sir Charles Bell has made some interesting remarks. "We see (says he) a small tumour of the gums, stationary for a long time, and claiming no attention, at last having its way into the bones of the face, filling up the cells and the cavities of the nose, pressing out the eyes, and rising at last upon the base of the brain itself," so as to destroy the patient. The worst diseases of the gums, according to Sir C. Bell, do not come from the irritation of a bad tooth. "We see a carious tooth attended with alveolitis and purulent, and abscess in the jaw, with singular tumours of the gums; even with necrosis of the jaw." We find the inflammation from the same source amounting to necrosis of parts to that of osteodermatitis. But these are of no account compared to danger with the tumour of which I am treating. This more dangerous disease begins when the shifting teeth are apparently solid, and when we cannot trace it to any common source of irritation. This tumour first appears itself in a small, hard protuberance of the gum, shooting out between two of the teeth; and the teeth being good is an unfavourable circumstance; for when they have become loose are unobscured without betray themselves through a sinus that the cavity is deep, and not as is removed by pulling out the tooth. It does not be curious and originally in fact we have a reasonable expectation of arresting the progress of the

ease by restoring the tooth; but when, independent of the tooth, the tumour has its origin in the membrane of the finger or in the socket, we cannot hope to extirpate the disease without removing the whole system of parts; the tooth, the gum, and the adjacent portion of the jaw. (See *Sir Charles Bell's Surgical Obs.* p. 43, non. Lond. 1816.) A perpendicular dissection of the alveolar process is to be made at a prudent distance from each side of the finger, and to the requisite depth, with a fine saw, any teeth in the way of its action being previously extracted. Then, with a strong pair of forceps, the pedicle of bone between the two fissures is to be broken off. The bleeding, which is copious, may sometimes be stopped by compression (dipped in the tincture of unslaked lime, but frequently requires firm and long-continued pressure with the hands of a succession of assistants, or even the actual cautery).

The soft and more superficial kinds of epulis may be extirpated with a scalpel, considering care to let the incision be sufficiently free and deep,

and then to scrape the alveolar process. He rubs the bottom of the wound with infusio of silver, which will generally stop the hæmorrhage, and lessen the chance of a return of the extraneousness. When the disease recurs often, as it did six times in a case mentioned by John Hunter, the removal of the parts must either have been imperfect, or the tumour cancerous, as happened in two examples which fell under his observation. (See *J. Hunter on Natural Hist. &c. of the Human Teeth* p. 186—C.)

GUNSHOT WOUNDS. Dr. Paul F. Eve, of Georgia, has kindly furnished me the particulars of a case of gunshot wound, in which one ball made six wounds. It occurred in a so-called "affair of honour," in which the balls passed through both thighs, and the right leg having been thrown forward at the moment of receiving the ball, it passed between the scrotum and perineum, inflicting a wound upon both. This ball thus made two wounds in each thigh, one in the perineum, and one in the perineum. The patient eventually recovered, and is now well.—RICH.

H.

HEMATOCELE. (From *hæm*, blood, and *cele*, tumour.) A swelling of the scrotum, proceeding from, or composed of, blood.

The term has sometimes been applied to every kind of extrusion of blood about the scrotum and spermatic cord, but at the present day it is usually restricted by British surgeons to a collection of blood in the cavity of the tunica vaginalis. Extrusion of blood in the cellular tissue of the scrotum and spermatic cord, or within the structure of the testicle itself, form, however, arrangements with hæmatocele. The law swelling is generally pyrexia, like hydrocele, but is distinguished from it by its greater weight and firmness, its want of transparency, its obscure fluctuation, and its cause, which is usually a blow upon the scrotum, or an accidental pressure of some vessels of the testicle or tunica vaginalis leading a hydrocele. When the latter membrane has been lacerated or much distended by the serous fluid of hydrocele, it becomes thickened, and its vessels, especially those of its inner surface, enlarged, and even varicose. If one of these becomes the way of the instrument with which the hydrocele is tapped, it is of course wounded, and then the fluid which is discharged is deeply tinged with blood. Should the bleeding continue after the evacuation of the hydrocele, the blood will accumulate in the cavity of the tunica vaginalis, and in the course of two or three hours the scrotum will again be considerably swollen. In one or two examples, I have known hæmatocele follow the tapping of a hydrocele with a lancet or other sharp-edged instrument. Sir Astley Cooper has noticed this risk as attending the plan of tapping a hydrocele with a lancet. (*On the Structure and Use of the Testis*, p. 212.) A gentleman in the Fleet prison told me his head to tip his hydrocele with a kind of long spring-lance of his own invention: the operation was followed by the rapid formation of a very large hæmatocele.

Sometimes one of the enlarged veins of the tunica vaginalis bursts of itself, after the fluid of a hydrocele has been discharged, and hæmatocele then comes on, as it were, spontaneously. According to Sir Benjamin Brodie, hæmatocele may arise from a diseased condition of the arteries. "This is analogous to that which occurs in the brain under the form of sanguineous apoplexy. There is a natural change which takes place in the arteries of old persons; they become ossified in patches and dissects; and I have known this to lay the foundation of hæmatocele." (*See London Med. Gaz.* vol. 1831-32, p. 937.)

As Sir Astley Cooper observes, hæmatocele is often connected with hydrocele, and is a consequence of it. The latter disease frequently becomes complicated with hydrocele from an accidental blow on the tumour, occasionally a rent in the tunica vaginalis. In such cases, operated upon by Sir Astley Cooper, this instrument had been ruptured to the extent of between one and two inches. The same distinguished surgeon records the case of a gentleman, in whom hæmatocele arose, not from a blow, but from excessive bodily exertion. (*On the Structure, &c. of the Testis*, p. 213-215.)

However, of all the causes of hæmatocele, a blow on the scrotum is the most frequent, and especially a blow from the point of the saddle in riding. I have known the disease produced, however, by external violence of different kinds; as by a fall against a piece of timber, by which the scrotum was violently struck. After such accidents, the scrotum will suddenly swell to double or triple its natural size. Every swelling so produced in the scrotum by effused blood is not invariably a collection of this fluid in the tunica vaginalis, for sometimes the extravasation is in the loose cellular tissue external to this membrane. Hæmatocele, as to be distinguished from the latter case partly by the density or firmness of the tumour, its slow or fluctuating nature, and by presenting itself more on one side of the scrotum than the other; while an extravasation of blood in the cellular tissue generally is more diffused, produces a dark blue discoloration of the part, and extends more or less to both testis.

When hematocele occurs in combination with hydrocele, the blood is mixed with the serum fluid contained in the tunica vaginalis, and partially dissolved in it: if the quantity of blood be small, the solution is complete; but in the opposite case coagula are formed, which remain undissolved. (See R. Brodie, &c.)

In the dissection of some hematoceles, the tunica vaginalis is found excessively thickened; and the blood in it, whether coagulated or fluid, is of the colour of coffee. Sir Astley Cooper refers to a preparation at St. Thomas's Hospital, exemplifying the serious mistake of removing the testicle, while the true disease was merely hematocele. The tunica vaginalis was excessively thickened, and filled with coagulated blood of a brownish red colour. (Op. cit., p. 215.)

A negro died in St. George's Hospital who had an enlargement of one testicle; but as it had increased little or to no consequence, the surgeon had not been consulted. Sir Benjamin Brodie examined the part after the patient's death, and found a very large quantity of gummy blood in the tunica vaginalis, and at the back part a soft, pulpy mass was seen, not at all resembling the testicle in structure, and only recognisable as such by its connecting with the epididymis and vas deferens. Sir Benjamin Brodie conceives that the changed state of the testicle had been occasioned by the pressure of a large quantity of blood. (See Lond. Med. Gaz., 1831-32, p. 927.)

Hematocele is sometimes unaccompanied by pain: this is the case when the quantity of blood is small, and no inflammation present. Under other circumstances, the disease may be attended with excessive pain, and ending in abscesses, gangrenes, and dangerous degrees of constitutional disturbance. This was exemplified in the person whom I have mentioned as having produced hematocele by plunging a large lancet into his own hydrocele, for the purpose of curing it himself. In this instance, which I viewed with Mr. Beardsley Cooper, if a free and prompt incision had not been made to discharge the matter and purify blood, the patient would soon have lost his life by the violence of the constitutional disturbance. Sir Benjamin Brodie mentions a painter, who was in the habit of drinking to excess, and who, while climbing a ladder, was seized with pain in the testicle; and an enormous hematocele formed. In this patient the symptoms he first were more nearly allied to meningitis than delirium.

If hematocele be occasioned by a laceration, and not accompanied by hydrocele, and the quantity of blood in the tunica vaginalis be moderate, the treatment should consist in keeping the patient in the recumbent position, applying leeches, administering purgative medicines, and covering the tumour with a cold lotion, which will have the effect of checking any further internal bleeding. These means will prevent inflammation, and, after a time, the blood will probably be absorbed. Were the quantity of blood considerable, no pressure might cause an absorption of the testicle (See R. Brodie, &c.), at all events, it would be likely to excite inflammation, and have little or no chance of being absorbed: in such a case, therefore, the best practitioners agree respecting the propriety of laying open the tunica vaginalis and taking out the blood.

If hematocele be combined with hydrocele, and free from much inflammation, Sir Astley Cooper recommends making an incision into the tunica vaginalis, discharging its contents, and,

without displacing any lint into the cavity, leaving the scar to be completed by the process of inflammation. (On the Structure, &c., of the Testis, p. 216.)

If, on drawing off a hydrocele, the contents are mixed with blood, Sir Benjamin Brodie always the fluid is collected again, and repeats the tapping at intervals until no blood is mixed with it. The injection may then be used with success. Should the quantity of blood be large, he regards the expectation of its being removed by absorption as hopeless, and therefore punctures the tunica vaginalis with a lancet, introduces a director into the opening, and then enlarges it with a scalpel. (Id.)

Whoever has read the observations of Pott on this subject will know that the operation of laying open the tunica vaginalis in the case of hematocele is sometimes followed by a severe attack of symptomatic fever, delirium, and even death. In unfavourable conditions, the symptoms will generally prove serious, whatever be the mode adopted in discharging the blood or the internal treatment. But now that the plan of introducing lint and other absorbent substances into the exposed cavity is abandoned, bad cases are far less frequent than formerly. The violence of the symptoms will generally depend upon the degree of inflammation in the parts, and the kind of constitution in which it occurs. If hematocele excite inflammation, the state of blood purifies, and a gangrenous suppurative follicle, attended with an accumulation of extravasated hydrocele in the part, and most urgent danger. Here a free opening must be made without delay, the scrotum polished or covered with cold lotion, and the patient kept under the influence of the muriate or acetate of morphia.

Mr. Pott, in his account of hematocele, comprehends one species, which he describes as an extravasation of blood within the tunica albuginea.

I confess that no good reason appears for including cases of this kind with hematocele; for what are they but diseased testicles which have been punctured, either on account of their containing a fluid, or really having within their cysts filled with chocolate-coloured malar fluid, as I have seen in hundreds of instances of sarcocoe? and, whatever blood is discharged, is not extravasated in the substance of the testis precisely to the purpose, but issues as a necessary consequence of that proceeding.

Another species of hematocele, noticed by Pott, arises from a bursting of a branch of the spermatic vein, between the groin and scrotum within the sheath of the cord. This, which is generally produced by great or sudden exertions of strength, force of agency, &c., may happen to persons in the best health.

I cannot conceive that, in any case, if a mere rupture of one of the spermatic veins, it can ever be justifiable to tie the whole spermatic cord, and then perform castration, though Pott avows this plan, if the bleeding branch cannot be tied early. Dissecting applications and an occasional purge will almost always disperse the swelling; and if not, opening it, and taking out the blood, applying cold, or, if necessary, filling the cavity with lint, and using compression, would be, according to my humble judgment, the most judicious treatment.—C.]

DIABETES. Dr. Isaac Parry reports two cases of congenital double diabetes, with an operation, and remarks on the method of separating

the bridge of the nose in these cases. (See *Amer. Journ. for May, 1834.*)

Dr. Mott, of New-York, has had extensive experience in this operation, having performed it nearly 200 times. In simple cases he recommends that the operation be delayed two or three months. In the compound double hare-lip he operates on both sides at the same time, with one set of stitches, leaving the intermediate portion in the form of a wedge. In the complicated variety, with fissures through the bones, he recommends an early operation, and has performed it successfully in nine days after birth, though he thinks it better to wait two or three months. When performed thus early, the fissure in the bones will close in the course of a single year. Such has been his experience in more than 20 cases of this form. He has also treated compound complicated cases, having a double fissure through the bones, with successful success.

The importance of teaching the child to feed with a spoon before attempting this operation should never be lost sight of, nor should the child be permitted to nurse after the operation until the lip is united. Dr. Mott has never employed pins in any form of this disease, but finds the interrupted suture to be adequate to every variety of hare-lip. I have lately had occasion to operate upon a young lady of 30 years of age, who in infancy had been twice operated for with the twisted suture, and in both instances the pins were torn out, and the deformity being increased, all hope of cure was abandoned, and she grew up, therefore, without its repetition. In this case, which was a compound double hare-lip, though it was necessary to remove as much of the lip as bore the cicatrices of the former operations, I employed only the interrupted suture and strips of adhesive plaster. The result as this whole case has been most gratifying, perfect union having taken place in four days, so that the stitches were removed, and scarcely a mark of the deformity can be discovered.

In the compound complicated variety of hare-lip we often find a projection of one side of the jaw-bone in the form of a proboscis. This should be removed, as preliminary to the operation on the soft parts, by a strong pair of scissors or the bone-saw. Dr. Mott has occasionally found it necessary to employ the actual cautery in these cases, to arrest the hemorrhage from the bone which has followed the removal of this protuberance. In such cases it is better to defer for a few days the incision and suture to the lip. Dr. March, of Albany, has been very successful in removing these shocking deformities by a similar operation. He too employs interrupted sutures, nearly transfixing the lip, and introducing them nearly half an inch from the edges of the surfaces which are expected to unite.—(Roux.)

[HEMORRHAGE.—TOUNIQUET.]

At the present day, the means for the temporary stoppage of the flow of blood through the arteries in operations are reducible to two, viz., pressure, and, in a few instances, the preliminary application of a ligature on the trunk of the vessels exposed to blood in a dangerous degree. Pressure is made either with mechanical instruments or the hand. In prostates, M. Dupuytren rarely employed any other means but the hand of an intelligent assistant, and it was only in special cases that he had recourse to the ligature or mechanical pressure. The same rule is adopted by Mr. Liston in University College

Hospital; and I sometimes dispense with the tourniquet myself. Two conditions are necessary to render pressure effectual, whether made with an instrument or the hand; the superficial situation of the artery, and its position upon a bone, or some other part sufficiently yielding to admit of the vessel being pressed against it. (See *Dupuytren, Clin. Chir., t. iv., p. 371.*)

M. Dupuytren confirms, that every experienced operator is well aware of, namely, the fact of the flow of blood through the larger arteries admitting of being commanded by means of moderate pressure. But this must be made with precision, and particularly to the surface, which serves as a point of resistance. The inclination of the surfaces of the bones on which the vessels lie should therefore be recollected. For example, that of the upper surface of the horizontal branch of the maxilla turns upward and forward, and that of the fast rib upward and slightly outward. Consequently, in the groin, the pressure should be directed from above downward, and from before backward; and in the hollow, above the clavicle, from above downward, and from without inward. If the operation short to be performed is likely to be long, or the artery is large or rather deep, M. Dupuytren recommends the assistant to place the fingers of his unoperated hand over those which compress the vessel, in order to second their action, and hinder them from being fatigued. But, before beginning the operation, the surgeon is always to assure himself of the exactness of the pressure. In some regions of the body, and in thin persons, the diastole and systole of the vessel are perfectly visible, and then the stoppage of them denotes that the pressure is well made. The total interruption of the pulsations, as ascertained by the touch, will leave no doubt on this point. There are some anastomoses in which every moderation of pressure may be dispensed with, even though arteries of great size are concerned; such are cases in which the principal artery will be cut only in the final division of the parts, and in which an assistant who can be relied upon will let his fingers follow closely the knife, and seize hold of the flap containing the artery, and compress this vessel just before the section of the flap is completed. This method is practicable in anastomoses at the shoulder, and even in those of the hip. M. Dupuytren knew of only one case in which the preliminary ligature of the artery was absolutely necessary in amputation, viz., that in which the disorganization of parts, and of the artery in particular, was such that a defective ligature on the surface of the stump would in all probability fail. In this circumstance he cautions tying the arterial trunk above the point at which the amputation is to be performed. (See *Clin. Chir., t. iv., p. 282, 285.*) I would ask, however, should this measure be preliminary, or ought it not rather to be deferred till the failure of the ligature on the face of the stump has been proved? The performance of two series of operations instead of one must never be undertaken without a positive necessity. Most of the preliminary operations on the trunk of arteries, hitherto performed for the prevention of hemorrhage during amputations, and in the removal of the upper or lower jaw, are now considered to have been unnecessary. In England, we should never anticipate in parts known beforehand to be so disorganized that ligatures would have no chance of securing the vessels on the face of the stump.

In the article *Ampu'tation*, many observations will be found on the advantages and disadvantages of tourniquets in that operation. M. Dupuytren sometimes employed, instead of a common tourniquet, what he terms a *compressor*, which makes pressure only on two opposite points of the limb, but, as he acknowledges, it would not be sufficient, if it were necessary, as in a case of extreme bleeding, to arrest the blood in the arteries of the limb. (See *Clin. Cir.*, t. iv., p. 268.) The compressor is an old instrument, consisting of a segment of a circle of steel, and the pressure of which is regulated by a screw. It has often been tried in England for the cure of postural aneurism. It is an instrument which, I think, ought always to be kept ready in hospitals, where many cases present themselves, especially of secondary hemorrhage from stumps, the painful achilles, &c., where its application might be of important use. Professor Requin, of Pisa, in a case of aneurism, where secondary hemorrhage took place from the femoral artery, high up the limb, and when, in consequence of disease, any other ligature would probably have failed, applied Dupuytren's compressor, and thus made moderate pressure on the bleeding point with complete success.

TORSION.

"As even the most considerable arteries, in cases of lacerated wounds, frequently do not bleed, in consequence of the violent contraction of these vessels, and the change produced in the disposition of their tunics, the idea of stopping hemorrhage by methodically twisting the end of the wounded arteries, led to trials of what is called *torsion*. The practice was first hinted at by Galen, and proposed in modern days by M. Amussat, in 1820, and about the same period, also, by MM. Velpeau and Thierry. (See *Saxen, des Hemorrhagies*, p. 155.) After having ascertained, by experiments on animals, that torsion was capable of arresting hemorrhage from the cerebral, tracheal, and caecal, and other arteries of mammals, M. Amussat tried this method on the human subject in angustion, contusion, and the removal of the tongue. In one case he adopted it after amputation of the shoulder-joint. In none of these instances did any secondary hemorrhage arise; but union by the first intention was followed only in one of the cases referred to, viz., that of a child. In 1828, M. Lisler, surgeon to the new hospital at Berlin, tried the plan with equal success; and about the same period it was first resorted to with success by Dr. Frick, of Hamburg, by MM. Rost and Dieffenbach, of Berlin, and by M. Schöndor, at Dresden. On the other hand, in France, the practice of torsion proved unsuccessful after two amputations performed by Professor Delpech. As the patients did not die of secondary hemorrhage, perhaps their cases have nothing to do with the advantages or disadvantages of torsion. In the hospital of St. Louis, at Paris, however, torsion failed as five out of six cases of amputation. Baron Dupuytren, having been requested by the Institute to make a report of the merits of the plan, tried it in the Hôtel Dieu, and came to the conclusion that *torsion may be safely applied to wounds of small caliber, but that it is imprudent to trust to it when there are of a large size*. (See *Clin. Cir.*, t. iv., p. 319.) In a certain number of instances, torsion of the arteries has been followed by extensive inflammation and abscesses in the sheath of the artery.

With regard to its increasing the chance of union by the first, inasmuch as no extensive aneurism is left in the wound, experience has not proved that it has any advantage over the ligature (*Dupuytren*, vol. vi., p. 403), and, as M. Hunter's researches show, the process of torsion kills a small portion of the artery, and the little slough is, in point of fact, cured as much an extraneous substance as the ligature itself. (See *Traité Théorique et Pratique de la Ligature*, &c.; also *Saxen*, Op. cit., p. 161.) Torsion is practised in two modes; *simple*, which is termed by the French *torsion libre*, the end of the artery is taken hold of with a pair of forceps, gently drawn out, and twisted round from left to right eight times, according to its size. This is the plan adopted by M. Thierry (*Art de Tisser des Armes*, Paris, 1820) and by Dr. Frick; but as it has been found sometimes to produce inflammation, extending along the coats of the vessel, and even to rupture a collateral branch, the plan recommended by M. Velpeau is mostly preferred in France. This gentleman takes hold of the end of the artery with a pair of forceps, having a grasper or not, draws it out of the wound, and secures it from the surrounding tissues; then he takes hold of it near its base with a second pair of forceps, with which he fixes it, while with the first pair of forceps he performs the torsion, three or four times for small arteries, and eight for large ones. (See *Le Nouveau Système des Hemorrhagies*, &c., Paris, 1830.) Some improvements were made in the practice of torsion by M. Amussat. He prefers torsion with longish, flat blades, and which when being kept firmly shut with a screw. He was particularly at dividing the inner coats at the base of the end of the artery with his finger-nail, or the second pair of forceps, and then makes them away from the surface of the vessel, as it were, into the vessel. The torsion then only affects the external coat. The artery is then closed by a kind of double valve, on either former side, the formed of the internal coats, and another by the twisted external coat.

In practicing torsion, great care should be taken not to introduce one of the blades of the forceps into the mouth of the artery; for then all the three coats might be torn; and the bleeding not be stopped. (See *Dupuytren*, *Clin. Cir.*, t. iv., p. 315.)

We find, then, that torsion does not consist in methodically twisting the end of the artery, but that the two internal coats are also to be separated, torn, and pushed back from the external by the instrument adopted. Then the torsion is of the external coat.

As the twisted end of the artery sloughs, and necessarily excites some degree of suppuration, this fact seems to explain why torsion is not less objectionable than the ligature, as preventing union by the first intention. On the whole, I believe that M. Dupuytren's report of it, above referred to, is as correct as it is concise. The ligature only interferes with union by the first intention in the part of a wound where it lies; the rest may still heal in the desirable manner.

The hemorrhage from the base of lacerations sometimes proves exceedingly obstinate, and in stages of death from this cause have occasionally happened, particularly in children. When common methods fail, the plan has been recently tried of passing a fine sewing-needle through the skin on one side of the wound, and another through the skin on the opposite side, and then

twisting were thrust round the needles, so as to draw them together, and close the hole. The experiment fully answered. (*See Lond. Med. Repository*, January, 1819, p. 23-26.)

Though arterial hæmorrhage in operations has received full attention, it must be acknowledged, with M. Dupuytren, that venous bleeding has not attracted due consideration. At the instant of the soft parts being divided, when the name of the blood has been suspended by compression, a profuse quantity of the fluid sometimes gushes from the wound. Inexperienced surgeons, alarmed by this circumstance, stop the operation, and, by deranging the compression already made, rather increase than lessen the bleeding. Here, according to Dupuytren, the colour of the blood should guide the operator. If dark-coloured, it comes from the limb below the incision, and, as it will soon cease, it is of no importance. But in operating on parts abounding in veins, and in which the circulation has not been interrupted, the dark-coloured bleeding will sometimes go on, fill the wound, and hinder the operator's proceedings. This is often illustrated in laryngotomy and tracheotomy. In other instances, the blood flows out profusely from the large veins which are divided, the patient turns pale, and seems as if he would perish on the operating table. Dupuytren observes that the continuance of such hæmorrhage depends more upon the patient suspending respiration than on the size of the veins, and the blood not being then able to pass through the lungs, makes its escape from the veins divided in the operation. Here it is essential to apply ligatures; because, if one set of veins were tied, another set would begin to bleed. But correctly the patient has filled his lungs two or three times completely with air by making full inspirations, the hæmorrhage ceases. These precepts were never forgotten by Dupuytren; whenever he divided considerable veins, either in the trunk, face, neck, or any part of the limbs. (*See Leçons Orales de Chirurgie Clair.*, t. IV., p. 285.) It would appear, from the researches of M. Ponsomme, that the interruption of respiration only has influence on the portion of the venous system above the diaphragm. (*See Journ. Chim. Médic. de Médecine*, t. I., p. 286, et t. II., p. 57, *Sic.*, Paris, 1831.) However this may be, the practical observations of M. Dupuytren are highly important with reference to venous hæmorrhage in the extremities of thoracic tumours from the neck, or aneurism tracheotomy, and all other operations in the thoracic region of the neck, a region so abundantly supplied with veins of all sizes. The long and deep inspirations, however, recommended for the suppression of venous bleedings, are suggested by M. Sauton to have had, in some instances, a share in promoting the entrance of air into the veins, particularly when one of those in the upper part of the body has been wounded, and, in consequence of its position being indurated, it gapes, as with such aneurism to M. Delpech, in the axillary vein (*Chir. Chir. de Montpellier*). The passage of air into the wounded veins, observed by Broussais, Dupuytren, Gracé, Mont, and Clerot, usually destroys the patient almost instantly, unless care be taken to place a finger over the wound in the vein, as was done by M. Clerot. (*See Sauton, des Hémorrhagies Traumatiques*, p. 81.)—C.

HEMORRHOIDAL TUMOURS. Dr. J. C. Warren has operated very frequently in this disease, and with extraordinary success. In 100 cases he practised circular excision by the knife,

and in 25 he fastened both the ligature and the knife; not less so, in any of them, met with any bad consequences. A very large proportion of the cases were completely cured, and in all of them the patients were so benefited as not to regret the operation. In seven cases, perhaps not demanded the use of the knife, and in all these he succeeded without any untoward results.

Indeed, the use of the knife for the removal of hæmorrhoidal tumours, as advocated in the Dictionary, is practised in the United States to a great extent. That alarming hæmorrhage has occurred in the limbs of surgeons, requiring the actual cautery for its suppression, will be seen by the testimony of Dupuytren, who nevertheless strenuously advocates the use of the knife.

Very many American surgeons, however, employ the ligature, variously modified, instead of the knife. Some, by passing a needle through the tumour doubly armed, and then tying the ligature on both sides, and allowing the ligature to remain until it sloughs off, which often requires several days. Many others, however, adopt the caudæ and wire ligature, as recommended by Dr. Physick, and Dr. Gibbon has succeeded in this way in cases as formidable as those described by Dupuytren, without any of the mischief which followed the excision practised by that surgeon. Its advantage consists in the wire being at once permanently tightened, so as to destroy the part in a few hours, when it can be removed, instead of waiting the protracted lapse which the ordinary ligature requires for successive days and nights.

Very valuable practical hints on this topic will be found in Dr. Gross's late edition of *Lancet's Elements*.—RACCOL.

HERNIA. In the last volume of the *Transactions of the Medical and Surgical Association*, my friend, Mr. James, of Exeter, has inserted an interesting paper on the signs which distinguish the sac in hernia. Among others, are perhaps admitted to be writers, he mentions the possibility of drawing down more of the intestine. "If (says he) we have opened the sac, I believe I may affirm that it will rarely happen that we cannot draw down some further portion—a very good practice, say, on many accounts; while, if we have not, this will be manifestly impossible."

"Another point, which has not been adverted to, is the very size of the tumour, which offers, as it appears to me, a highly important indication; for if it be small intestine, it must, if exceeding the dimensions of an ordinary knuckle, present the appearance of a convoluted, supposing the sac has been opened, or of great intestine, it must exhibit the characteristic appearance of bands." (P. 151.)

Dr. O'Heime is the author of some original observations on the primary causes of strangulation, and on what he considers to be an improved mode of performing the facts of cases of intestinal hernia. The latter consists, first, in the introduction of a gum-elastic tube into the sigmoid flexure of the colon, and retaining it there while the taxis is used. Secondly, if this fails to diminish the size and dimensions of the hernial tumour, a syringe is attached to the tube, and encephalic mucus thrown up, the water process being repeated until the bowels are sufficiently freed either solid and fluid contents, and then the tube is again introduced without the syringe being attached to it.

Dr. O'Heime informs us that he has employed

this treatment, and seen it employed by others, during the last eight years, with the most gratifying results. Some of the cases alluded to, with an exposition of the principles on which they were treated, appeared in *February, 1833*, in his work, entitled *New Views of the Process of Defecation*, &c., and others were afterwards recorded in the *Lond. Med. and Surg. Journal*. It is Dr. O'Beirne's doctrine, that the abdominal openings are perfectly inactive in the production of strangulation, and that the causes of this state arise in the protruded parts themselves. He argues that, when the protrusion takes place, a current of fluids is impelled into the protruded intestines, "which becomes so distended as to be driven (the sac alone being interposed) against the firm margins of the ring, and often with such force as considerably to dilate the latter. The distension is of course resisted by the ring, and, according to the situation of the hernia, either by a strong or a weak fascia; but below this point, the bowel being opposed by little more than external restraints, yields readily, and becomes rapidly enlarged to a size so disproportionate to that of the opening through which it descended, that it is no longer capable of repassing into the abdomen. There is, at the same time, another cause operating to prevent its return for the great expulsive muscles, although they soon cease to act simultaneously or with the same force, still act so as to direct and maintain a constant current and pressure of fluids against the strangulated gut. There are reasons for believing also, that the bowel is more or less shagled above as well as below the ring, so that the latter lies imbedded in a hollow formed by the sac and the inguinal. In this way, pressure from within and resistance from without unite in causing the margins of the hernial opening, although totally inactive, per se, to produce a much greater degree of constriction of the sac and the intestine than they could possibly produce if they really possessed the activity attributed to them by many." Dr. O'Beirne differs from Mr. Goodenough in believing that, when a knuckle of intestine becomes strangulated, air may still pass into and out of the bowel so connected, as consequence of the existence of a narrow channel of communication between the protruded bowel and that within the abdomen. That this is frequently the case, I think all practical surgeons will admit; but whether it is constantly the case, seems to me questionable. Be this as it may, Dr. O'Beirne contends that the cavity of the strangulated gut is not dilated, but permits air to pass freely into and out of it, that all the portion of the small intestine within the abdomen and the whole of the caecum and colon are distended, and also afford free passage to the air; and that the sacrum is contracted, and alone opposes the escape of this elastic substance. If, previous to a double-strangulation, the bowels should be loaded with solid and fluid feces, so as to prevent the passage of fluids, or the success of the first introduction of the tube, Dr. O'Beirne insists on the necessity of persevering, with the aid of repeated enemata. The gut-tube used by him is sixteen inches in length, and the syringe about seven inches long and one in diameter. The tube should be made soft by immersion in cold water, made straight, and then a few inches of it are to be well oiled. It is to be introduced as the patient lies on his left side, and passed up inch by inch, and in the course of the rectum. If stopped, it may be slightly withdrawn, and afterwards passed gently

upward. But if it cannot be got further up without much force, the syringe is to be attached to it, and fluid thrown up as a strong antispasmodicum by an assistant against the press. is resistance, while the surgeon urges the tube freely upward. Many other interesting observations on this practice have been inserted by Dr. O'Beirne in the *Dublin Journ. of Med. Science*, vol. xiv., art. 7-9-G.

[The late Dr. Joseph Parikh, of Philadelphia, a short time before his death, published a volume of "Practical Observations on Strangulated Hernia, and some of the Diseases of the Urinary Organs." In this work the student of surgery will find a greater amount of practical information on this subject than can anywhere else be obtained in our language. The same surgeon has also published in the *Eclectic Repository*, vol. x., p. 108, a case of strangulated hernia, with observations on the treatment of anastomosing aneurism.]

In the *American Journal* for May, Dr. Evers reports two interesting cases of hernia, in one of which the patient has entirely recovered after the coccyx was removed.

Dr. N. R. Smith, of Baltimore, has operated for strangulated hernia in thirty-two cases, and the result of his operations has been the entire recovery of the patient in thirty-three instances. Dr. Munsey, of Cincinnati, has performed thirty-two of twenty-four operations for strangulated hernia, and generally with successful and permanent results in two of them.

Dr. Parroquet, of Philadelphia, has devised and executed an important operation for the radical cure of reducible hernia: by the insertion of the sac after its contents were returned, and a ring applied over the internal ring, so as to shut off the abdominal cavity. He employed for the purpose a gold-stilet or cannula, stretched upon a large acupuncture needle, the tube being then and closely fitting the needle, so as to enter the sac without difficulty. The needle being well drawn, with a small syringe he injected thirty minims of tincture of iodine in some cases, and the first index in others, into the sac. A compression and strong truss being then applied, the patient was confined to bed for a fortnight. When the sac was small, he found a single operation sufficed to prevent the descent of the hernia, but when it was of large size, the injection was repeated two or three times. Two cases were thus treated at the Philadelphia Hospital, and no permanent inflammation or other untoward result followed. These patients were now relieved from wearing a truss, and he writes afterward, while they remained under observation, had no return of the hernia.

Dr. Detmold, of New York, has lately published the same operation as for strangulated hernia in a case of reducible hernia, and effected a radical cure. He was induced to attempt it at the importunity of a lady, who was distressed by her husband immediately after marriage, on discovering the hernial tumour under which she had long laboured, but of which he had not been informed. He recorded the consternation of the patient on removing him from his marital contract, and she therefore applied to Dr. Detmold and besought him to perform the operation, declaring that, unless this obstacle to her union could be removed, she would drown herself. The nature of the infirmity was fully explained to the husband, but his prejudices resisted every remonstrance. Under these circumstances, Dr. Detmold proceeded with the operation as in cases

of strangulation, and, having cut down upon the sac, he reduced it without opening it, scathed the aneurism and filled it with fat, producing granulation and closure of the sacculus, effecting a complete cure of the hernia. When the recent husband heard of the recovery of his wife, manifested in submitting to this painful and dangerous operation, he consented, and, without waiting for the result, expired, but, as his wife and the parties are ever since happily united, surgery having removed the only hindrance to domestic felicity.

M. Guerin, of Paris, has recently applied the abdominal method to the operation for strangulated hernia. The only case yet reported in the *Gazette Médicale* was a congenital epiphora, which had been strangulated three days. The division of both the abdominal rings, and of the antero-superior wall of the inguinal canal, was effected subcutaneous, and the reduction was immediately accomplished. If this approach continues to prove the success of this method of operating, vision will soon cease to be necessary among the qualifications for a surgeon; for a blind man could perform subcutaneous operations as well as M. Guerin himself, since a knowledge of anatomy with the sense of touch are the only requisites in such operations.

Complicated cases of hernia, in which a finger-like protrusion or duplication of the peritoneum was found covering the sac, so as to prevent the appearance of a hernial sac entering to the true hernia, and rendering diagnosis difficult until, on issuing it in the operation, the parts within were found to be unlike either intestine or omentum, and both to be confined into the abdomen. Professors McDermock and McClan, of Philadelphia, have encountered these cases.

The various assistants proposed for the radical cure of hernia have attracted much attention in the United States within the last ten years, and several controversies of the nature of quackery have been introduced to the public as possessing the power of accomplishing this result with considerable certainty. The alleged radical cure of hernia in the person of a farmer in Kentucky, by the substitution of a rough chip of wood for the pad of his instrument, which had been worn out and could not be immediately replaced, led to the construction of several instruments by Dr. Hood of that state, which were said to prove successful in most cases, by causing obliteration of the neck of the sac and its adhesion to the surrounding parts by adhesive inflammation.

These instruments, which had been introduced by the agents of the inventor to the notice of the French and English surgeons, have not maintained their position in professional confidence after undergoing the test of experience; but in the investigations induced by these publications originated a series of inventions by Dr. Hester Chase, of Philadelphia, which have received the sanction of many of the most prominent surgeons. In the year 1831, the whole subject of the radical cure of hernia by means of trusses was referred by the Philadelphia Medical Society to a special committee of three surgeons, and, after three years' careful observation, they produced a report highly favorable to the claims of the inventions of Dr. Chase. Their opinions and cases will be found in a preliminary report published in the *American Journal of Medical Science* for February, 1836, and a final report in the same journal, for August, 1837. The views of the investigators

fully developed in a work entitled "Treatise on the Radical Cure of Hernia by Instruments, by Hester Chase, M.D., Philadelphia, 1838," which contained, also, an extended analysis of the *modus operandi* of all the variety of the truss.

The claims of the advocates of the Medical Society, Dr. Reynold Coates, considering the theory of cure by agglutination as erroneous, and attributing the unsuccessful results of the instruments of Dr. Hood, and the failure of some of the earlier attempts of Dr. Chase, to the modifications of the form of the pads employed, especially with the view of producing inflation and consequent adhesion, strongly urged the opinion that the occasional success attendant upon the use of ordinary trusses, and the happier results of some of the novel contrivances, were due, not to adhesion, but to a coaction of the hernial orifice, analogous to that occurring in the lower portion of intestine in artificial anus, and in other false passages under certain circumstances. His views are presented in an elaborate letter, found in Chase on Hernia, p. 107, and led to the abandonment of the attempts to produce firmation intentionally.

From this point the efforts of Dr. Chase were directed exclusively to the perfection of the means for producing complete and permanent relaxation of the bowels, and these success may be judged by the few extracts appended to the following consideration of the essential and novel portions of the several apparatuses.

The most important point in each of the instruments of Dr. Chase is the pad or block, by cause upon this depends most essentially the relaxing power. To be fully understood, each block, at a glance and perspective view of it, must be seen; but the following verbal description will give some idea of their appearance. They are all formed of some smooth wood, not too hard or too porous.

For common inguinal hernia, the block resembles a longitudinal section of a long oval cylinder, generated by the revolution of the curve upon its axis, and afterward moulded by force, producing considerable flattening upon one side, and a much more abrupt curvature upon the other. The long axis of the block is designed to make pressure from a point half an inch or more forward, and upward from the internal abdominal ring to near the middle of the external ring. The thicker, or more abruptly curved side, forming a very slightly prominent shoulder, compresses accurately the whole length of the abdominal canal, and the thinner, broader, and more compressed side gently but firmly supports the neighbouring ribs of the abdominal surface, and, with them, the circumference of the hernial orifice, so it is large or small.

For semi-obscure hernia, the block resembles that for common inguinal hernia, the subcostal being much broader, it was supposed to be very strongly compressed upon its upper or broader convexity, until its lower or more sudden curvature is able to arching the base to a great extent, particularly near the middle of the length of the block; so that when the block is placed upon its base and viewed perpendicularly, it presents on one margin a semi-elliptical curvature, and on the other a very obtuse parabolic. The compression of the subcostal segment is much greater towards one extremity than at the other, so that the substance of the block is made to overhang the base very far at the opposite end; and hence the thickest part, as well as the most

overhanging portion, as found at about two thirds of the entire length distant from the thinner extremity. The most projecting part of the overhanging edge, when applied, corresponds with the edge of the pubic hair, exactly at the base of the external ring; but it is prevented from pressing upon the bone by its curvature. The thinner end of the block extends upward and outward nearly to the external ring, and the latter portion of the curved surface supports the overhanging portion of the lower half.

The block for femoral hernia resembles an oval about two and a half inches long by one inch wide, truncated by a plane passing from the extremity of the long diameter at the narrow end, making with it an angle of about twenty degrees to a point distant about two thirds the length of the egg. This figure is considerably flattened on either side of the plane of section, and the overhanging large end of the oval is compressed until it is converted into a broad shoulder parallel with the plane of section, and running the entire width of the wood. When applied, this shoulder presses at first immediately beneath Poupart's ligament; and after the absorption of the subcutaneous fat, which always occurs during the use of these instruments, it is made to dip beneath the ligament, and rise to support the hernial orifice, while the remainder of the oval surface compresses the sigmoid canal, and extends so as to cover the cribiform form at the lesser extremity of the block.

These several forms of block are each fastened by a malleable plate, and are attached to a little steel plate appended to the truss-spring by means of two screws, which pass through a fenestra in the plate, and admit of a variation in adjustment to the extent of about an inch in the direction of the longitude of the block.

The myrioid and ventro-femoral trusses have the steel plate attached to the truss-spring by means of a short, soft iron neck, which, by its flexibility, admits of an expansive adjustment in the direction of the block. In addition to these arrangements, the femoral truss has its soft iron neck elevated, bent at a right angle, and curved with the spring by means of screws passing through a large fenestra in the spring itself, and permitting extensive and accurate adjustment in a direction from or towards the central line.

A plan of adjustment analogous to that last mentioned constitutes the principal peculiarity in the myrioid truss, the spring of which always encircles at least two thirds of the body.

The double truss, a novel and beneficial arrangement, consists of two single trusses, which may be respectively adapted to any combinations of hernia in the inguinal or femoral region. The springs rise over each other behind, the two spring-covers extending but two thirds of the length of the springs from their anterior extremities, where they terminate, each in a strap one of which passing through a cystic hole formed by the loop of the other at its place of attachment to the spring-cover, gives the double spring all the appearance of a single instrument, with infinitely happier means of adjustment.

As success depends upon the accuracy of reduction, a considerable number of blocks of each kind, with slight modifications of relative proportions, are required in practice.

In speaking of these instruments, the committee of the Philadelphia Medical Society remark:—They have effected the permanent reduction

into retention of the intestines in every case of hernia that has come under their observation, without interference to the patient, and often under trials more severe than are usually required by those who wear other trusses; and which would be impatient with any other apparatus known to the community.

The committee feel justified in recommending strong terms the instrument of Dr. Chase to the confidence of the profession, as the best known means of mechanical reduction in all varieties of hernia, and as furnishing the highest chance of radical cure.

In their preliminary report, the committee expressed decided opposition to the employment of trusses in infants. Careful details of the record, and further observation has shaken their opinion on this subject. Several cases, treated at a very early age by the instrument under notice, have proved that they are, in all instances, convenient in infancy. Several instances out of this will be found noted among the evidence in the appendix to this report. The adoption of the trusses to the comfort of children under three years of age, and their secure retention at an age establish their claim to preference over any other mode of treatment. Their applicability within the year has been successfully proved in two cases; and it is certain that the same is adapted to confine the bowels by any form of bandage or compress, than by means of a well-regulated spring and block. The only comparative trial of the softest and best block in use had been resorted to in favor of the latter; but the committee feel bound to give the victory of high-surgical skill and extremely exact attention in dealing with these little subjects.

The time required for the removal of an ordinary case of ventro-femoral or double hernia in the adult appears to be from twelve to eighteen months. It is probable that the best, in certain inguinal hernia, is resolved more in a shorter time; but practice has proved the earlier relinquishment of the truss, even in a very few cases. The relief in double hernia appears to extract somewhat more easily, but all the varieties, however, each more rapid in resolution.

The cases observed include all the usual forms of enlarged hernia, whether resulting from mechanical or physiological causes, and the various instances of double and triple hernia. The complications which have not been presented are known to be very rare, and the trusses themselves feel no hesitation in expressing a strong and, they think, well-grounded hope that a very large majority of the cases of this double hernia will yield to the action of the apparatus of Dr. Chase, when under the direction of persons of high surgical and mechanical talents. —*Final Report.*—[RECEIVED.]

(HERNIA CEREAL. Dr. G. B. B. of New-York, has published, in the N. Y. Journal for 1849, an elaborate paper on this subject, in which are laid out all the means to be used. It is creditable to the author's industry and talent.

In a case of hernia recently lately treated by Dr. March, of Albany, and which occurred after a permanent fracture of the femoral bone of a child, the patient recovered after the removal of the fungus by the scalpel, under a suitable compress and adhesive planter. The following, however, often encountered in these cases, led Dr. March to suggest the application of the atmospheric method in such cases, by means

HYDRIODATE OF POTASSA.

HYDROCELE.

ring a portion of the adjacent scaly, after having prepared the edges of the strapping the fingers for its reception, and the removal of the engaged tissue. There can be little doubt of the adhesions being nearly secured in such a case, and the necessary compression might thus be gained in a much more easy and preferable to the means usually employed for the purpose. It is a novel application of this antiseptic principle, the absorption of which is essential to this success, and would hardly fail of success.—*Review.*

[HIP-JOINT. Dr. John C. Warren, of Boston, has published an elaborate paper on the subject of dislocation of the hip-joint, accompanied by plates, which are well executed, and constituting together a volume of great value to surgeons and medical practitioners. The occasion of the publication was a lecture, in which a respectable surgeon of New-England was involved by a suit for mal-practice, and in which Dr. Warren's testimony had been perverted in the style which is characteristic of a certain class of legal practitioners, who arrogate a right to pervert to critical knowledge in forensic medicine. Dr. Warren has treated the party concerned as he deserves, while he has accomplished himself redress in a manner most becoming to the profession.

Dr. George W. Nares has published, in the 24th volume of the *Amer. Journal*, a entire paper on the diagnosis of injuries of the hip, which is worthy the attention of the surgeon.

In Dr. Nares's *American edition of Lacroix*, p. 162, a description is given of Dr. Physick's method of treating this disease, and in which he had extraordinary success.

Professor Townshend reports numerous instances of recovery from morbid osseous, or hip-joint disease, by an operation which is said to succeed after morbid results have followed the inflammation of the joint. He makes an incision between the gluteus maximus and rectus muscles, and carries it down to the foot, laying open the joint. Immediately after this operation, he states, as the result of his experience, that the pain, distention, and progress of morbid action in the joint all cease, and the patient speedily recovers, in some instances infirmity. He has thus opened the joint in all cases during the acute inflammation, and even after the bone has become carious; and though, in the latter cases, where the bones of the joint have seriously suffered, some inability to use the limb may remain, yet in all instances there is a mitigation of the disease and early recovery. I have no experience in this mode of treatment, but find the failure of all other methods pursued in this formidable disease, even the actual cautery, I regard the suggestion of any method which promises better success, worthy of record, and hence give place to the testimony of Dr. Townshend, who speaks very confidently of the safety and utility of his method.

A surgeon of Philadelphia has lately imputed to the joint for this disease a most unorthodox and unsatisfactory proceeding, and one which no reputable member of the profession will ever imitate.—*Review.*

[HYDRIODATE OF POTASSA. Frequently employed externally, in conjunction with iodine, for promoting the absorption of collections of fluid, and scrophulous and other indolent swellings. The hydropate "adds the solution of iodine in water, and on this second it is given in combination with iodine in aqueous fluids." M. Lacroix

formally is of iodine ʒi. j. hydropate of potassa ʒi. jss., and distilled water ʒi. xij. One fourth portion this solution is to be administered in diluted doses in the course of the day. M. Lacroix forms a bath also of iodine by similar means." (See J. T. Thomson's *Elem. of Materia Med.*, p. 423, col. 2.) I have known the hydropate of potassa, given internally in doses gradually increased up to 10 or 12 grains three or four times a day, dispense success. Friction with the acetum over the abdomen was simultaneously resorted to. That at all the times of the hydropate, its efficacy in syphilis appears the most important as practice. (See *Syphilis and Venereal Disease*, p. 101.)

[HYDROCELE. Dr. Pineau, of Philadelphia, employs a new mode of operating upon hydrocele, by making an incision with a coronal finger, and after a little fluid escapes, he makes pressure upon the tumor until a little bag of the serous membrane containing the contents protrudes. This he draws out with the forceps or hook, and by threadly stripping with the scissors and gentle traction, he removes the greater part of the peritoneal serous tunic. He then sutures the side of the scrotum, including the testis, with strips of adhesive plaster, and a cure has speedily followed. (See *Dagblom's Journal* for July, 1842.)

Dr. March, of Albany, after trying the various methods of operation for the radical cure of hydrocele, has for the last ten years adopted the following plan with uniform success. Holding the tumor in one hand, and making the skin loose, he makes an incision with the scalpel an inch and a half in length through the skin and cellular tissue down to the tunic, selecting its anterior and lower part. He next makes an incision one third less in extent through the tunic, and, after emptying the sac, studies the point of the scrotum by his finger, and injects an ounce of tincture, previously diluted with eight ounces of lime-water. He keeps this mode of treatment up to avoid the accident which has sometimes occurred, of injecting the cellular tissue of the scrotum, and the disastrous consequences of such a blunder.

These are cases in which this disease may be preferable plan, after extensive experience in this operation, by the cautious use of the trocar and cannula, I have inevitably avoided the accident deprecated; nor have I ever any with any important either to the injection of the sac, or the ready escape of the fluid employed. No one operation, however, should be indiscriminately adopted or exclusively preferred.

Dr. J. Watson, surgeon to the N. Y. Hospital, has for several years relied upon compression for the radical cure of this disease, in preference to injections, setons, or the other various methods pursued by different surgeons, after emptying the sac either by the trocar or the latter. He straps the scrotum firmly over the testicle by means of strips of adhesive plaster, and tightens the straps as the tumor diminishes under the pressure, keeping up the compression for weeks, if required. He has found it necessary to repeat the operation in some cases a second time, and occasionally a third puncture has been necessary, but more frequently a single operation, followed by the pressure, has sufficed for the cure. An opportunity having occurred for a post mortem examination of a patient who died eight months after the operation, Dr. Watson found the testis atrophied, and no trace of disease in the tunica vaginalis. From the fact that this patient had

liberated under an extensive complication of disease in the scrofula, testis, and cord, coexisting for a long time with the hydrocele, stimulating carcinomatous induration, it would appear probable that compression on the plan of Dr. Watson may be found useful in the treatment of other affections of the testis and scrotum, and deserves a trial.

This mode of compression by narrow strips of adhesive plaster has been long employed in the Péninsular Hospital, in chronic inflammations and enlargement of the testicle. (See Dr. Norris's edition of *Lectures*, p. 447.)—RANNEY.

[HYDROCEPHALUS. Professor Dugas, of Georgia, reports in the *Southern Medical and Surgical Journal* for 1836, a case of chronic hydrocephalus treated by repeated punctures, which possesses many points of interest for, though unsuccessful in the end for it proved the practicability and haemorrhage of penetrating the brain in such cases, for in this case the brain was punctured seven times, and sixty-three ounces of fluid drawn off during the few months that the child survived the disease. Not the slightest unpleasant effect followed either operation; and on the autopsic examination, sixty-four ounces of a limpid fluid were found in the head, and contained in a sac composed of the expanded cerebrum lining the dura mater, and in which the crura of the seven punctures were distinctly visible.]—RANNEY.

[HYPERTROPHY (from *hypo* and *trope*, signifying an excess of nutrition). This term ought to be restricted to cases in which a part, though increased in bulk, retains its natural organization and structure. It is one of the most common effects of increased activity in the nutrition of textures and organs, and likewise one which may give rise to the most diversified functional disturbance. It cannot always, however, be regarded as a disease. The mere increase of size of a part, unattended with change of structure, or the interruption or disorder of any function by such hypertrophy, cannot be considered as a morbid affection. Thus hypertrophy in a muscle of animal life is not a disease, but in the heart it becomes one of the most serious. (See Andral, *Anal. Pathol.*, t. i, p. 100.) It can hardly come under the denomination of a disease until it interferes with the regular and complete accomplishment of a function. As one of the most distinguished of modern pathologists observes, "That the increased abnormal development of an organ or tissue, denominated hypertrophy, depends essentially on an excess of the nutritive function, appears to be sufficiently demonstrated by the evidence, on the one hand, of an increase of bulk, and the distress, on the other, of any adventitious sort of fluid effusion. The organization and structure remaining unaltered is also further evidence that the increase of bulk is

owing to a superabundant deposition of the natural solid constituents of the affected tissue from an excess of the nutritive function." (See R. Cruveilhier's *Illustrations of the Elementary Forms of Disease*, leucæmia ix.)

1. Many hypertrophies seem to arise altogether from augmentation in the habitual activity of the functions of organs. "The prodigious development and power of the muscles of the superior extremities of the blacksmith, and of the inferior extremities of the stage-dancer, are striking examples of hypertrophy resulting from the influence of the frequent and increased exercise of a function, the effect of which is a corresponding increase of nutrition, and of development of the muscular tissue." The abnormal development of the muscles of profusory action, as those of the heart, bladder, and intestines is likewise often produced of a similar nature, an increased exercise of themselves in general; these organs having been excited and kept up to some extent a morbidly excited state to the very nature of their respective contents." (Cruveilhier, &c.)

2. Some hypertrophies take place as the physiological result of what Andral calls active hyperæmia, either acute or chronic, or, in other words, of a great determination, or of a copious afflux of blood to parts for a number or longer time.

3. Others proceed from some physiological or pathological stimulus, some irritation of the nutritive function creating an excess of it. (See Andral, *Précis d'Anal. Pathol.*, t. i, p. 100.)—C.]

[HYPOSPASIAS or BYPOSPASIAS (from *hypo*, under, and *spas*, to draw). The congenital imperfection in which the urethra terminates at the under part of the penis, seldom not extended sufficiently far forward to reach the right situation of its orifice in the glans. Sometimes there is a vestige of this orifice, sometimes none. Half an inch or more of the urethra may be deficient. About two years ago I was consulted by Mr. Baker, of Stenon, for a case of hypospadias in a young child. In this instance I cut a new passage through the glans, and having established a communication between it and the urethra introduced a silver tube. This was worn for some time, and the little opening having been touched with caustic, a complete cure was brought about. The management of the case was attended with some difficulty, and would not have answered with a piece of Indian gum catheter, which was at first tried; and it was necessary to get Messrs. Weiss to fabricate, at a short notice, a silver tube for the purpose, furnished with a rim, and surmounted by which it could be conveniently fixed. Mr. Liston has sometimes succeeded in completing the passage by turning back a portion of the prepuce, and uniting it without any cast, i. e. with the integumentary outward. (On *Practical Surgery*, p. 476.)—C.]

J.

[JAW-BONE. Dr. J. C. Warren, of Boston, has twice operated the upper jaw; in his first case the patient died three months after in the course of the disease; consequently; but in the other case, remarkably successful, the operation. The same surgeon has removed large portions of the lower jaw seven times with

astounding results, all his patients having recovered.

Dr. Valentine Mott, of New-York, has performed the excision of portions of the lower jaw ten times; and in two instances he has removed this bone at the articulation on one side. In one of these latter cases, the tumour, osteosarcoma,

was nearly as large as the joint's head; and involving the symphysis, as it did, the buccal tooth of the opposite side was removed, and the bone saved through at that point, while on the other side it was necessary to remove it at the articulation.

For Dr. Meit's operation for removing immobility of the lower jaw, see note to article Anchylosis in the text of this edition.

Dr. Meit has removed portions of the upper jaw fifteen times.

Professor Alexander H. Stevens, of New-York, reports a case of osteosarcoma of the upper jaw, successfully treated by the extirpation of the whole of the alveolar maxillary and alveolar bones, and portions of the orbital and sphenoid bones. The account of this formidable operation, with remarks alike creditable to the author's science and humanity, will be found in the N. Y. Journ. of Med. and Surg. for 1840. In this article Ankylosis it will be seen that Dr. Stevens was the first surgeon who ever removed the upper jaw. The operation was in 1823, and Dr. David J. Rees's case in 1824, both of them prior to Mr. Lassar's, of Edinburgh, to whom Mr. Lison attributes this merit by mistake.

Dr. Paul F. Eve, of Augusta, Georgia, has twice removed the upper jaw, and once a large portion of the lower jaw by excision. The latter operation and one of the former were successful. One of the cases in which the upper jaw was removed was osteosarcoma, which was after removal, and carried off the patient.

Dr. McClellan has removed the upper jaw thirteen times, and has performed numerous operations on the lower jaw, removing portions of this bone nine times—twice more than half the bone, including the articulation on one side, and in one instance excising the whole of the lower jaw.

Dr. N. E. Smith, of Baltimore, has successfully amputated the lower jaw; and in one case he removed all that portion between the second molar of one side and the condyle of the other.

Dr. F. D. Mutter, of Philadelphia, has removed nearly the whole of the upper jaw, including both superior maxillary bones, which were involved in that malignant form of disease called epulis, and which originated in the gums. The difficulty has been since remedied by the introduction of a gold plate, to which a row of artificial teeth has been attached, and which conceals the deformity. Dr. Mutter has twice removed a large portion of the lower jaw for tooth-sarcoma, and there has been no return of the disease in either case, although in one of these three years has elapsed, and the other nearly one year since the operation.

Dr. Randall, of Philadelphia, has removed nearly the whole of the lower jaw for an osteosarcomatous tumour, and the patient recovered. (See Amer. Journ. of Med. Science for 1829, p. 188.)

JOINTS, EXCISION OF. This operation consists in the removal of the parts of bones entering into the formation of a diseased joint, together with the whole of the capsular ligament and synovial membrane. "It has a twofold object: the first is to remove a formidable disease, and this might be effected by amputation; the second is to preserve a useful limb, and this amputation could not effect. The fact is worth noting in which the proposal mainly rests, is, that, in the large majority of the alveolar diseases of joints, the bone is either primarily affected, or becomes so secondarily." (See Blackburn in *Guy's Hospital Reports*, vol. 1, p. 271.)

Whether a passage quoted by M. Velpeau from Hippocrates refers to the complete excision of joints, or sometimes practised in the present day, is doubtful. As Mr. Blackburn observes, it may only allude to the removal of the ends of bones in compound dislocations. The record of the first actual performance of the operation is now found in a note appended by Mr. Park, of Liverpool, to a collection of manuscripts on this subject published by Dr. Jeffray, of Glasgow, in 1800. It is there stated that, in 1702, Mr. Filkin, of Northwich, in Cheshire, in a case of diseased knee, removed the patella, along with the articular extremities of the femur and tibia. A similar operation was performed on the shoulder in 1707 by M. Vizarotti, of Montpellier. (*Cher. de Chir. Pratique*, Montpellier, 1812. In 1708, Mr. White, of Manchester, planned the diseased head of the humerus, and with such success that the patient could afterward carry heavy weights, and resumed every motion of the arm. (See White's *Case and Obs.*, Phil. Trans., vol. 17.) In 1771, White's practice was imitated by Mr. Bent, of Newcastle, and a few years afterward by Mr. Orpet, of Chester. (See Phil. Trans., vols. 176 and 181.) With the exception of Mr. Filkin's case, however, in all these examples only one articular surface was removed. (See *Amputation*.) The merit of suggesting the operation, as defined in the first sentence of this article, unquestionably belongs to Mr. Henry Park, of Liverpool. In a letter to Mr. Pett, dated 1792, Mr. Park made the proposal of totally extirpating many diseased joints, by which the limbs might be preserved, with a share of motion that would still allow them to be very useful. In order to learn whether the popliteal vessels could be avoided without much difficulty in the excision of the knee, Mr. Park made an experiment on the dead subject. An incision was made, beginning about two inches above the upper end of the patella, and extending about six below its lower part. Another one was made across this at right angles immediately above the patella, down to the bone, and nearly half round the limb, the leg being in an extended state. The lower angles formed by these incisions were raised, so as to lay bare the capsule ligament; the patella was then taken out; the upper angles were raised, so as fully to denude the head of the femur, and to allow a small catgut to be passed across the posterior flat part of the bone immediately above the condyles, care being taken to keep one of the flat sides of the point of the instrument quite close to the bone all the way. The catgut being withdrawn, an elastic annula was introduced in its place, to guard the soft parts while the bone was sawn. The head of the bone thus exposed was carefully dissected out; the head of the tibia was then, with care, turned out and sawn off, and as much as possible of the capsular ligament dissected away, leaving only the posterior part covering the vessels, which, on examination, had been in very little danger of being wounded.

The next attempt was on the elbow; a simple longitudinal incision was made from about two inches above to the same distance below the point of the olecranon. The integuments having been raised, an attempt was made to divide the lateral ligaments and subdivide the joint, but this being found difficult, the olecranon was sawn off, after which the joint could be easily dislocated without any trifling incision, the lower extremity of the os humeri being cut off, and

afterward the heads of the radius and ulna. This appeared an easy work; but Mr. Park concludes the case will be difficult in a diseased state of the parts, and that a crucial incision would be requisite, as well as involving the humerus above the condyle, in the way done with respect to the thigh-joint.

Mr. Park first operated, July 3, 1811, on a strong, robust sailor, aged 32, who had a diseased knee of ten years' standing. The man's sufferings were daily increasing, and his health declining. Mr. Park wished to avoid making the transverse incision, thinking that, after removing the patella, he could select his object by the longitudinal one; but it was found that the difference between a healthy and diseased state of parts deceived him in this expectation. Hence the idea was relinquished, and the transverse incision made. The operation was finished exactly as the one in the final subject related above. The quantity of bone removed was very little more than two inches of the femur, and rather more than one inch of the tibia. The only artery divided was one on the front of the knee, and it ceased to bleed before the operation was concluded, but the eplysis of the bones bled very freely. In order to keep the refractory integuments from falling inward, and the edges of the wounds in tolerable contact, a few squares were used. The dressings were light and superficial, and the limb was put into a cast sufficiently long to receive the whole of it, from the ankle to the insertion of the gluteus maximus.

I shall not follow Mr. Park through the treatment. Suffice it to remark that the case gave him a great deal of trouble, and that it was attended with many embarrassing circumstances, arising chiefly from the inability of keeping the limb in a fixed position, the great depth of the wound, and the abscesses and sinuses which formed. On the other hand, however, the bad symptoms were not at all dangerous. But the patient was obliged to keep his bed nine or ten weeks, and it was many months before the cure was complete. The man afterward went to sea, and did his duty very well.

Subsequently to the publication of the letter to Mr. Pitt, another excision of the knee was performed by Mr. Park on the 23d of June; but the event was unsuccessful, as the patient lingered till the 10th of October, and then died.

In 1783 the year following that of the publication of Mr. Park's pamphlet, the subject was brought before the Academy of Surgery in France by M. Moreau. In 1784, this surgeon excised the head of the humerus and the glenoid cavity. In 1792 he operated on the elbow, and he and his son several times excised the articular surfaces of the knee, ankle, shoulder, elbow, and wrist. Their example was followed by Desmeunier and Dupuytren. In 1800, Maudslayi, of Groningen, cut out a knee-joint. (See *Wharton, Dict. de Articul. Extremis*, 1810.) In 1810, M. Moreau, of Paris, performed the excision of the elbow. (See *Edinb. Med.*, 1839.) In 1823, the same operation was executed by Mr. Crumpton, who has likewise excised the knee with success (see *Dublin Hospital Reports*, vol. i. &c.) and in 1835 by Mr. Syme, who has excised the elbow in fourteen cases. The operation has since been suggested for these three joints, by Mr. Syme, of Otago, in Yorkshire; by Dr. Simpson, of Edinburgh; by several correspondents of the Glasgow Infirmary (see *JP. Fane's Case Reports*, &c.); by Mr. C. Adam Key (see *Blackburne's Key's Hope-*

al Reports, vol. i.), and in University College Hospital, by Mr. Liston. The operation has also been executed by M. M. Charrière and his pupils. (See *Vulpian, Nouv. Élév. de Méd. Opér.*, t. i., p. 553.)

In the first elbow case, operated upon in 1779 by M. Moreau, the patient went on so favourably that he was allowed to go about whenever he pleased, with his arm supported in a cast. The limb was at first powerless, but it slowly regained its strength, and the man could ultimately throw corn with it, and hold the plough. Seven months after another operation of the same kind performed by M. Moreau the patient was completely well, and in two years more the flexion of the arm was very distinct. In another case the patient got well in six weeks, and in three months more joined his regiment.

In all Moreau's cases, the function and extension of the forearm were preserved, which circumstance, no doubt, depended very much on the insertion of the nerves not being destroyed. After the excision of the knee, however, the bones grew together.

Excision of the Elbow-joint.—The following is the plan of operating recommended by Mr. Syme, which is nearly the same as that practised by M. Moreau. The patient should lie with his legs downwards, so as to prevent the posterior surface of the joint. The incision, with a straight, narrow, sharp-pointed knife, makes a transverse incision into the joint, close above the olecranon, and extending from the inner side of this process to the external condyle. In doing this care must be taken to avoid the ulnar nerve, which lies close to the inner side of the olecranon; and, with this view, the safest plan is to introduce the knife perpendicularly into the joint, with its hand directed towards the nerve. At each extremity of the transverse cut, the surgeon must make an incision about an inch and a half long, both upward and downward, in the line direction of the limb, as in a figure two separate flaps, and give to the wound the shape of the letter H. These flaps being detached from the adjacent parts, the olecranon may be easily removed with the saw or pliers, after which an difficulty will be experienced in raising the lateral ligaments, making the end of the humerus protrude, and sewing it off above the condyles. The head of the radius may next be cut away with pliers, and then the excision of the sigmoid cartilage of the ulna, left after the removal of the olecranon, may easily be accomplished with the same instrument. "It might, he thought better to take away all the ulna that required excision at once; but the attachment of the brachial vessels to the sigmoid process renders this very difficult, especially if it is attempted before the bone space offered by the removal of the other bones has been obtained." (See *Syme's Principles of Surgery*, p. 214, vol. 2, 2nd ed., 1837; also, *Treatise on the Excision of Dislocated Joints*, 8vo, Edinburgh, 1831.)

M. Moreau begins the operation by making an incision, between two and three inches long on each side of the joint, commencing about two inches above the condyles and carried down in the direction of the ulna to the height. These two wounds were next connected by a transverse incision through the skin and tendon of the biceps, immediately above the olecranon, and the flaps were then raised.

As soon as the flaps have been raised, Dupuytren recommends us cautiously to open the sheath of the ulnar nerve, behind the internal condyle,

and the nerve to be kept inward and forward by an assistant with a bent probe, at the period when the humerus is to be divided. The preliminary removal of the clavicle, as directed by the same eminent surgeon, is regarded by M. Malgaigne as unnecessarily complicating the operation. (See *Monat. de Méd. Opér.*, p. 243, ed. 2.)

When the flaps have been dissected, and the axillary nerve drawn forward in front of the inner surface, the undivided soft parts are to be drawn in the same direction; the muscular fibres then detached from the bone with the point of the knife; a spatula or flat piece of wood introduced in front of the humerus, and the bone sawn through from behind forward. The lower pole of it is then to be inclined downward and backward, and separated from all its connections, the anterior, external, and internal lateral and posterior ligaments being cut through in succession. As a thick muscle, the *testis internus*, is interposed between the humerus and the artery, the avoidance of the vessel becomes attended with any difficulty. If it be necessary to carry the incision down to the foramen, as far as the laceration of the artery, this vessel is more exposed to injury. It is of great importance, if possible, to saw the skin above the insertion of the *brachialis*, and more especially the *radialis*, above that of the biceps. Mr. Syme, however, has divided the biceps lower down, and yet the use of the hand was preserved. (See *Volkmann's Atlas*, *de Méd. Opér.*, t. i., p. 563.)

Mr. Liston prefers a single perpendicular incision at the outer side of the joint, and the *quadratus* cut. An incision is made on the radial side of the ulnar nerve, and in the direction of the bone, by passing the point of the knife through the *ligamentum* and *flexor* of the triceps to the back of the humerus, and carrying it in contact with the ends of that bone and the glenoid for about three inches. Another incision, commencing over the outer condyle of the humerus, and penetrating to the articulation, is made to fall at the middle of the at right angles. The two flaps are reflected, and the soft parts, with the nerve, are turned over the outer condyle. The ends of the bones, but slightly retained by their ligaments, are turned out of the wound by bending the forearm. During the course of the bone, the *glenoid* is of use in protecting the nerve or other soft parts. A partial ankylosis will be found occasionally to have formed, and then the saw and cutting forceps may be called in. In operating upon young subjects, the cutting forceps may sometimes be used in preference to the saw, the bones being soft, and extensive removal not demanded. After turning the edges of the wound together with three sutures, Mr. Liston applies wet lint to the wound for a few hours, and then strips of plaster; the sutures are soon removed, and the tepid-water dressing employed. After a week or two, the limb which has been kept bent on a pillow, is secured in splines, and supported in a sling. (See *Liston on Prost.*, Surgery, p. 140.)

The above point, Mr. Blackburn observes, has been so frequently noticed that it would be alike useless and tedious to present an analysis of each operation. The two *Messieurs* secured three cases, all successful; and state that they had operated several other times, and always with fortunate results. M. Roux recalls three cases, which have terminated favourably, and one which terminated unfavourably. (Review Med., 1833.) Mr. Syme numbers no less than nineteen opera-

tions, of which only two have been attended with unhappy results (*On Diseases of Joints*, &c., in *Ed. Med. and Surg. Journ.*, for 1832, 33, 4-5); and Messrs. Key, Crumpton, Chatterlain, Spence, Simpson, and one of the surgeons to the Glasgow Infirmary, can each furnish a successful case. The operation is said to have been performed with fortunate results by Messieurs in Italy, by Eschschütz in France, and by Mr. Bond of Newcastle. Altogether, there are 31 of which histories have been given. Of these, there have been fatal; one patient dying at the end of five weeks, from the combined effects of phlebitis and of an enormous abscess of the hip; and the two others from septicæmia more immediately connected with the operation. Of the remaining twenty-nine, nearly all recovered the motion of the joint: in three or four a retained effusion and rigidity, principally from neglect of the instructions given as to exercise. In the one of these cases, the constitutional irritation that followed plagues. All the patients had been suffering for many months, or for years; the most approved methods of treatment had been tried unsuccessfully, and in many instances, extensive suppuration had recommended amputation. In a few, the recovery was very rapid; but in the majority, some months elapsed before the joint could be pronounced to be quite sound and set into small spaces smoothed open, though exercising no employment. The patients, in general, returned to their previous occupations. One of M. Roux's was occasioned to see his cousin thrashing, ploughing, &c.; and one of Mr. Syme's wrote to him, two or three years after the operation, to say that his arm was strong enough to carry eighteen or twenty pounds weight with ease; that he could raise six or eight pounds to his head; and that he could write and perform any ordinary work, "so that no person would know (his secret) whether I had my elbow or was without it." &c. At the meeting of the British Association, held at Edinburgh in 1844, Mr. Syme produced several persons on whom the operation had been performed, along with the position of bones removed, and Dr. Hodgkin, that the other members present were surprised and gratified by the strength and mobility which the new articulations had acquired. (*Gag's Hosp. Reports*, vol. i., p. 231-233.)

There is just, in reality, a new joint with a capsule formed, but the ends of the bones become connected by ligamentous fibres, and a sufficiently firm substance is produced to serve as a fixed point for the muscles, which execute the flexion and extension of the humerus. (See *A. Volkmann's Atlas*, &c., t. i., p. 564.)

Besides the cases above alluded to, Mr. Liston has had others which proved successful, and one of them in University College Hospital.

In general, no vessel requires a ligature. One patient, under M. Roux, however, had a secondary hæmorrhage—a solitary occurrence.

Mr. Syme recommends the wound to be closed with sutures, and a long figure of 8 bandage to be applied to support the limb, "which should be bent at a right angle, and to prevent the ends of the bones from moving, or pressing againstly on the soft parts." Rigid scars of four or more to be made in the neighbourhood. "I do think, after the first two or three days, will feel himself most comfortably in the erect position; and when the inflammatory tension begins to subside, he should gently, but diligently, exercise the limb, so as to preserve the mobility of the elbow." (See *Syme's Principles*, p. 216, ed. 2.)

In the five operations which Mr. Liston has performed on the adult, he has aimed at bringing about a sort of ligamentous ankylosis, by steadily keeping the parts for a long while by means of leathern straps with the femur at a right angle. On the contrary, in young patients, he says, "the motions of the part may be encouraged, and with every chance of their becoming free and strong." (*On Potential Surgery*, p. 138.)

Excision of the Knee-joint.—In a knee-joint, Mowat, the father, operated as follows: He made a longitudinal incision on each side of the thigh, between the crutch and the femur of the leg, down to the bone. These incisions began about two inches above the condyles of the femur, and were carried down along the sides of the joint till they reached the pita. They were united by a transverse cut, which passed below the patella oblique to the bone.

The flap was raised, but the patella attached to it, being dissected, was dissected out. The limb was then bent, so as to bring the condyles of the femur into view. As it was desired to cut them from the body of the bone before dislocating them, everything adjoining to them behind, where they joined the body of the bone, was separated, and at that place the forefinger of the left hand was passed through in order to press back the flesh from the bone, while the saw was used. The knee having been bent, Mowat drew the cut piece towards him, and easily detached it from the flesh and ligaments.

The head of the tibia was laid bare by an incision nearly sixteen lines long, made on the spine of that bone. The first lateral incision on the outer side of the knee was extended nearly as far down on the head of the tibia. Two were obtained one flap, which adhered to the flesh, filling up the articular space, and another triangular flap formed of the skin, covering the outer surface of the tibia, which lobe was if necessary exposed before the saw could be applied.

Upon raising the outer flap, the head of the tibia came into view; and, after being separated from its attachments, was cut off with a small saw. The inner flap was then raised, and the head of the tibia, having been separated from the muscle behind, was saved also. (*See Mowat & Co. Op. postérieurement à la Résection des Articulations affectées de Cancer*, Paris, an. XI.) Some cases and remarks in favour of the excision of diseased joints have been published by Mr. Erastus. (*Phila. Hospital Reports*, vol. II., p. 163, &c.) He has remarked with success one knee and one elbow. Another knee operation may be set down as a failure, no union having taken place, and a suppuration discharging contents to the bone until the patient's death, three years and two months after the operation. Respecting the plan of operating on the knee, he concludes thus: "I am satisfied, from repeated trials on the dead subject, that the operation can be most safely and rapidly executed by separating the condyles from all their attachments previously to sawing the bone. As soon, therefore, as the flap covering the patella is turned upward, the edge of the knife should be carried round the condyles close to the bone, so as to divide all the ligaments which connect the femur with the tibia. The tibia goes then, with great ease, is pushed backward, and as much of the protruding condyles can be removed as the operation may think necessary." (*Ibid.* ch. p. 218.)

It does not appear necessary to insert in this

work the account of cutting out the ankle-joint, an operation which will never be extensively adopted; nor shall I add anything more concerning the mode of removing, in a similar way, the shoulder-joint. In treating of amputation in this situation, I have already said enough, and whenever wishes for further information respecting this practice must refer to Dr. Wilson's work, entitled "*Cases of Excision of Cancerous Joints*," Glasgow, 1806. Dr. Jeffrey recommended a particular, and, indeed, a very expensive saw for facilitating the above operation. The saw alluded to is constructed with joints, like the chain of a watch, so as to allow itself to be drawn through behind a bone, by means of a crooked needle, like a thread, and to cut the bone from behind forward, without injuring the soft parts. In placing the saw under a bone, its cutting edge is to be turned away from the flesh. Handles are afterwards hooked on the instrument.

According to my notions of the treatment of diseased joints, so long as the patient's strength is not exhausted by the irritation of the local disease, amputation dictates the propriety of preserving in an attempt to save the affected limb, &c. Will a patient, greatly reduced by hectic symptoms, be able to recover from so much and bloody an operation as the dissection of the whole of the knee-joint out of the limb? If some few could escape with life and limb preserved, would the talk of persons trained in this matter have the same good fortune? I cannot admit that the extraction of the whole of so large an articulation as the knee can be compared with the operation of amputation in point of simplicity and safety. However, it is not on the difficulty of performing the former that I would found my objections; but I believe that any man possessing a tolerable knowledge of the anatomy of the leg might venture to achieve the business. The grounds on which I withhold my approbation from the attempt to cut out the knee are the following: 1. The great length of time which the healing of the wound requires. Whenever peruse the case of Hector McLaughlin will find that the operation was performed on the 23 of July, 1821, and that it was February 28th of the following year before all the subsequent discharges were perfectly healed. The entire of thirteen very nearly eight months! Mr. Pink describes the patient to be a strong, robust sailor, and gives no further particulars concerning the state of his constitution than that his health was declining. I entertain little doubt, that, if the excision of the knee had been performed in that state of the health in which amputation becomes truly necessary, the man would not have survived the illness arising from the operation. The only other case in which Mr. Pink extirpated the knee ended fatally. In the history related by Mowat, there seemed, indeed, to be considerable liability. The patient endured the last surgery uncomplainingly, so severe an operation; and, afterwards, would confess, the patient was in, with a sickle and Mowat asserted he would be able to walk some weeks in shallow boots or sandals. The young man in the mean time was attacked by an epidemic dysentery, and died. On the 21st of October, 1809, Walker extirpated the knee-joint of a pregnant woman in the Hospital at Strasbourg; but she died of typhus on the 8th of the following February. He observes that the operation is much facilitated by removing the ends of the femur and tibia in their detached state. (*See*

Dis. th. Articulis corporis auctore G. H. Wucherer, 1810.) 2. Even supposing the extension of the knee to be followed by all possible success, is the advantage of having a mutilated, shortened, stiff limb, in lieu of a wooden leg, sufficiently great to induce any man to submit to an operation beyond a doubt infinitely more dangerous than amputation? I think not. The practice is at present nearly exploded in this country; but I hear every now and then of its being adopted at Paris, and Mr. Crompton has thought it worthy of revival. The difficulties of his operations, however, and tediousness of the after-treatment, and, in particular, the general course and termination of one of his two knee-cases, as represented by himself, are sufficiently discouraging. No doubt more limbs might be saved by this practice than

by that of amputation, but more lives would be lost. On this principle, I see no reason for preferring excision of the knee to amputation. Many interesting observations on the extirpation of various thoracic joints may be found in the above-mentioned dissertation by Wucherer, and in the analysis of it by Laugewieck (*Bücher, für die Chir.*, b. 3, Göttingen, 1811); likewise in Mr. Blackmore's paper, in *Guy's Hospital Reports*, vol. i.

The latter gentleman's conclusion, from a review of nearly all the cases on record, is, that excision is admissible in the shoulder and elbow; that it is admissible, though of doubtful utility, in the ankle; and that it is inadmissible, except under very peculiar circumstances, in the wrist, hip, and knee. (*Op. cit.*, p. 294.)—C.]

K.

[KREOSOTE (from *κρεας*, flesh, and *ωσος*, I eat). A new principle, discovered by M. Buchsbaum in 1801 is pyroigneous acid and all the base, and is named from its property of preserving animal matter? According to this gentleman, it is of service in gastric, cancerous ulcers, rheumatic pains, and other diseases. It appears from Dr. Ellulson's researches that it has considerable power in checking vomiting, even that attending Asiatic cholera. He also found it of use in phthisis, epistaxis, diabetes, and neuralgia. "Of its external application (say he) I can speak favourably. When an ulcerated surface has required a stimulus, or when a slough, or unhealthy, perhaps offensive discharge existed, I have seen it of great utility. As it prevents or arrests putrefaction, and removes all taint in dead matter, we cannot be surprised at its restoring the offensive nature of discharges, whether from mucous membranes or ulcers, and preventing the injurious effects of diseased animal matter upon the part with which it is in contact. When the contents of the intestines have been very offensive, I have ungrudgingly assented with advantage, and I have employed it as a wash in mercurial salivator, as well as ulcerated, and in fæces of various parts of the system. I have seen foul ulcers become clean, and ulcers of long standing have sometimes healed rapidly on its application." Dr. Ellulson bears testimony, also, to its efficacy as pruritus pedis, toothache, and purpura. (*See Med. Chir. Trans.*, vol. xix, p. 217.) For external use, he says that from half a drop to two or three, diffused in water by means of pillage, will usually be sufficient, though

its application must be very frequent. I have tried it in a few examples of phagedenic ulceration in University College Hospital, and occasionally with success. I have known it used in the proportion of from three to eight or ten drops in each ounce of water. If given internally, it is best to begin with one or two drops, and increase the dose very gradually. In this way, one lady under Dr. Ellulson's care was able at last to take fifty drops as a dose.

It is alleged that kreosote, as an external application, is advantageous in preventing the contraction of cicatrices, and that it is therefore useful in burns. (*See Sir F. Smith in Dublin Journ. of Med. Science*, vol. xii, p. 217.) "In different eruptions of a scaly nature (says the gentleman), kreosote has been found decidedly useful, and perhaps the most favourable have followed its application to ulcers and solutions of continuity, having a venereal or scrophulous origin. From its known antiseptic properties, it has been recommended in gangrene." He also refers to its use as external and internal hemorrhages. Sir F. Smith tried it with success in phagedenic ulceration of the penis, disease of the septum narium, fetula in ano, tinea capitis, and cancerous ulcers. Sometimes he employed one part of kreosote to sixty of water; sometimes one of kreosote to sixty of acetic acid; and occasionally he brushed the edges and surface of ulcers with pure kreosote. His observations lead him to expect that kreosote would prove useful in cancerous cancer and chronic ulcers of the uterus. Further observations on kreosote will be found in *Edinb. Med. and Surg. Journ.*, No. cxxii.—C.]

L.

[LARYNGOTOMY. It consists either in puncturing the crico-thyroid membrane, as first proposed by Vicq d'Azy, or in dividing, at the same time, the thyroid cartilage in the middle line, as first suggested by Desault, or in dividing the cricoid cartilage and upper rings of the trachea, as originally recommended by Boyer. The last operation is sometimes termed *hæmo-cricotomy*. To these methods it is to be added that of

making the opening through the hyo-thyroid membrane, as proposed by M. Malgaigne. 1. The first modification of laryngotomy consists in opening the anterior part of the larynx in the small triangular membranous space which lies between the thyroid and cricoid cartilages. The thyroid cartilage is exposed by dividing the skin and subcutaneous tissue into the posterior surface of it, along the middle line, and at its lower third,

are inserted the thyro-arytenoid muscles and the chordæ vocales. The patient should be in the recumbent posture, with the head thrown back, so as to render the prominent Adam's prominence. The incision should begin over the upper part of the thyroid cartilage, and be carried down to the cricoid cartilage. The crico-thyroid membrane having been exposed, the crico-thyroid artery is to be depressed with the nail, and the membrane opened directly above it. A probe-pointed bistoury, or the blade of a pair of long-pointed scissors, may then be introduced, with the edge turned upward, and the cartilage cut in the direction of the middle line, without inclining to the right or left, for fear of injuring the chordæ vocales. (See *J. F. Malgaigne, Man. de Méd. Opér.*, p. 388, ed. 2.)

Of the operation performed in the crico-thyroid membrane, Sir Charles Bell entertains a favourable opinion. He directs us to slit up the membrane, and open the incision with the handle of the knife, when the patient will immediately breathe with ease. Here, says he, there is nothing to alarm the most timid operator. No great tough veins are opened, the cut is made above the thyroid gland, and above the accompanying branch of the thyroid arteries. The part is strongly marked by the prominence of the thyroid cartilage above, and the ring of the cricoid cartilage below. "If this occurs be temporary, a simple slit of the membrane will be found sufficient. If necessary, a transverse cut will afford any degree of opening. If a round hole be desired, the four corners left by the incision may be snipped off; or the edges of the opening may be kept steady by means of the divided wire of a catenar, the middle part of which lies on the wound, while the ends are kept round the neck, and tied with a ligature behind." In Sir C. Bell's cases, less annoyance was caused by this contrivance than the tube.

2. *Laryngo-tracheotomy*.—As the lower part of the incision implicates the trachea, the lachryms of the thyroglottic must be cut; but the pharynx of thyroid veins should, if possible, be avoided. Higher up, the knife passes through the skin, the fascia, the cricoid cartilage, and the crico-thyroid membrane, on which a small artery runs transversely. This it is desirable not to wound. The patient's head and neck being inclined back, so as to render the larynx prominent, an incision is to be made from the lower edge of the thyroid cartilage, and extended downward an inch and a half, so as to bring a portion of it over the trachea. As soon as the crico-thyroid membrane has been exposed, the artery is to be pushed upward with the nail of the left fore-finger; the hæmorrhoid opened below the vessel; and then the cricoid cartilage, and three or four of the upper rings of the trachea, divided from above downward. (See *J. F. Malgaigne, Op. cit.*, p. 388, ed. 2.)

3. *Laryngotomy through the Thyro-hyoid Membrane*.—This method has been proposed by M. Malgaigne. A transverse incision, about two inches in length, is made directly below the thyroid lobe. With the curved stroke of the knife, the platysma, and the lower half of each sternohyoid muscle, is divided. The point is then directed upward and laterward, and the thyro-hyoid membrane divided in the same transverse direction, together with those fibres of it which proceed to the epiglottis. The mucous membrane is thus exposed, and at each extremity it protrudes through the wound. It is now taken

hold of with forceps, and divided, whereby the epiglottis is brought into view; and, being fixed into the wound by the breath, is to be taken hold of with forceps, or a hook, by which means the whole of the interior of the larynx will be exposed to view, and the instrument passed into it under the guidance of the eye. (See *Manual de Méd. Opér.*, p. 402, ed. 2.)

With respect to the advantages of laryngotomy, Mr. Poirer pronounced it to be "an operation unattended either with difficulty or danger, and will answer every purpose when the cause of obstruction is seated in the mass glutinosa, or above it." (On the Surgical Pathology of the Larynx, p. 265.) A single opening in the crico-thyroid membrane would suffice for the introduction of a cannula, for the purpose of enabling the patient to breathe; but for the extraction of foreign bodies, it would be necessary also to cut the thyroid cartilage. The fact that extraneous substances, when they are loose, are almost always lodged in the upper part of the larynx, proves that laryngotomy, in such cases, must certainly be most advantageous; and, according to Desault, even when the foreign bodies are lower down in the trachea, they may, in general, be most easily extracted with the aid of a pair of curved forceps.

"Of the three situations (says Mr. Lawrence) in which it has been proposed to make the opening, viz. in the thyroid cartilage, between that and the cricoid, or in the trachea, I consider the first as the least eligible. Besides the objection from the configuration of the cartilage, and the danger of wounding or otherwise injuring the chordæ vocales, there is the inconvenience in the case of a large larynx arising from the swelling and thickened state of the membrane, which may actually impede the passage of the air. I am not aware of any objection to a transverse opening between the thyroid and cricoid cartilages. The prominence of the former in the neck serves as a guide to the part which should be used. Whether laryngotomy or laryngostomy ought to be selected, must, of course, depend on the nature of the case. In cases of cricoid, the proximity of the inflamed parts would be an objection to laryngotomy; while, in examples of large bodies within the glottis, this operation may generally be most advisable. It is almost to that of making one mode of opening in different cases." (See *Medico-Chir. Trans.*, vol. vi., p. 248.)

Laryngotomy, in King's College's manner, seems to M. Velpeau to be most easily performed, and to have the advantages of implicating no part of importance, and of leaving the pharynx unaltered; but when foreign bodies require extraction, the opening is too small for the introduction of instruments, and it would not admit a cannula of sufficient size to let respiration be freely carried on. Hence M. Velpeau thinks liberally of the plan of opening the larynx more extensively, especially as no artery or vein of importance is in danger of being wounded. This, he says, is the only method of exposing foreign bodies, which mostly lodge in the mass glutinosa, and of getting at polypus and other growths within the larynx. Although an injury of the chordæ vocales (says he) is easy to avoid, and of little consequence, yet although the voice is lost, some acquired by this operation, that others, yet it merits preference only in the cases specified, and when the thyroid cartilage does not contain too much phosphate of lime." (See *A. Velpeau, Nouv. Éléms. de Méd. Opér.*, s. ii., p. 507.)

As for laryngo-tracheotomy, which usually

leaves the thyroid gland un injured, but wounds the crico-thyroid artery. Mr. Velpeau observes that it does not, like the method of Desault, enable the surgeon to see to the bottom of the larynx; and while it is too far from the larynx to be convenient for the extraction of such foreign bodies as are not movable, it is but rare the guide for the safe employment of a trachea. Hence, except when Desault's plan is especially indicated, Mr. Velpeau generally guides tracheotomy.

Dr. M. Malgaigne's operation I cannot speak from experience; but, as being less simple than a division of the crico-thyroid membrane, or of this and the thyroid cartilage, it seems not to be entitled to general adoption, even where an opening very high up is desirable. Whatever considerations it may have in its favour, its external effects, depend upon its bringing the interior of the larynx more completely into view than is effected by other plans.—C.

[Dr. Meek, of New-York, has opened the larynx between the thyroid and cricoid cartilages, for the purpose of admitting air in acute and chronic laryngeal affections, with great temporary relief. In all the cases have been ultimately fatal. This is the candid confession of those who have admitted the experiment in untractable cases of croup, for which some of the tracheotomic surgeons have so highly commended its utility and success.—Russe.]

[LIGATURES. Dr. Kay, of Georgia, employs exclusively ligatures made of the tendon of which the door, when he exports water by the first intention; they were originally suggested by Dr. John Bellinger, of Charleston, South Carolina. In all cases where suppuration is anticipated, neither these nor any other form of animal ligatures can be relied on. Silk ligatures are universally employed in America in such cases.—Russe.]

[LITHOTOMY. The first and most important step preparatory to deciding upon this operation is the introduction of the sound, which should be of steel, and the handle of which should be smooth, so as to enable the surgeon to detect more readily the final touch of the calculus. The importance of certainty in making out our diagnosis in cases of stone in the bladder, will be appreciated when we are reminded of the mistakes committed on this subject by the most eminent of the profession. In Dr. Norris's edition of Liston's Practical Surgery, several examples of these mistakes are recorded, in which lithotomy was performed when there was no stone; and, on the other hand, patients have been postponed, after frequent bleeding, to have no stone, and, dying of the disease, very large calculi have been found in the bladder. The great Cleveland lithotomized in three cases and found no stone; Dupuytren, Roux, Desault, and many other European surgeons, have committed the same error. It has several times happened in America, and in the hands of men of established reputation. Even Dr. Physick, that when there never was a more cautious practitioner, came very near committing this sad blunder; for he says, "I wounded a patient, and had no doubt but that he had stone; his health, however, was bad, and I did not operate. He died soon after, and, upon examination, we found no stone."

In addition to the several directions given upon this subject in this Dictionary, the endoscope is found to be an invaluable aid to diagnosis in those doubtful cases in which the surgeon finds it difficult to feel the stone. This instrument I

have had occasion to use in two instances of this character, and we were enabled to hear the crystals by placing the stethoscope upon the perineum, over the pubes, and even upon the scrotum, when the sensation was infinitely not to the sound, and wholly invisible without the mode of auscultation. In both these cases the operation was performed as reliance upon this collector of the presence of the stone, and, as the result proved, with propriety. In one of these, the prostate gland was greatly enlarged previously, and the calculus occupied a site immediately behind it, from which I failed to dislodge it by changing the position of the patient, as suggested by Dr. Physick, placing him upon his head.—So also, the finger being introduced into the rectum while the sound was in the bladder, could not sufficiently elevate the calculus as to make it distinctly felt. Occasionally the convex portion of the sound would touch the calculus, and yet the next moment it was impossible to find it. But with the stethoscope the diagnosis became easy.

This object of recognizing with certainty the presence of the stone, is not, however, the only result which should be sought in sounding; but we can frequently ascertain the number of stones, their size, consistency, and sometimes their configuration, and whether rough or smooth, in several of which inquiries the stethoscope will be found useful, and deserves more attention than has hitherto been bestowed upon it, not only in this case, but in fractures, as well as in probing for foreign bodies in the ear, nostrils, or other cavities, and also in gunshot wounds. Cystitis may to this recognized in obscure cases with great readiness and certainty.

Dr. Physick's valuable improvement in the probe, so highly appreciated by practical surgeons, does not appear to have attracted attention in Europe; it consists in having a movable blade, which can be removed for the purpose of sharpening. The same gentleman recommends the introduction of a large gum-elastic catheter into the bladder through the urethra, together with a long slip of lint into the wound between the lips of the prostate, in cases of secondary hemorrhage occurring after lithotomy. The pressure thus produced upon the wounded arteries of the prostate and the vesicæ vesicales may be continued for several days, and until suppuration commences; the urine meanwhile passes off by the catheter instead of flowing through the wound. Dr. Gibson has twice had occasion to adopt this expedient of Dr. Physick, and in both instances he thinks the patients would otherwise have perished.

Dr. Gibson has performed the lateral operation over fifty times, and has lost but six of his patients.

The high operation above the pubes was performed by Dr. Gibson for the first time in America, and has since been repeated with success by Dr. McCallister, of Philadelphia; Dr. Carpenter, of Lancaster; and Dr. Van Vahala, of Lewisburg, Pennsylvania.

A case of calculus of so large a size that it could not be broken with the forceps occurred to Dr. Goddard, at Charleston, some years since; and, after having cut down into the bladder, the operation was abandoned, it being found impossible to break or to extract it, because of its enormous size. The wound healed up, and the man walked to Carlisle, Pennsylvania, where Dr. Gibson operated with the like result a second time. After his recovery he walked to Philadelphia.

him, when, for the third time, Drs. Gibson and Physick performed the operation, and, finding the stone almost to fill the bladder, Dr. Gibson applied a drill-bit as inch-worm, and made an opening large enough for the blade of the forceps; when, with the other, he soon quarried the stone and removed it. His patient recovered in two weeks, and again walked home, as Dr. Chapman remarks, "a stone lighter."

Mr. Cooper has made valuable additions to his article on the subject of lithotomy, which are here inserted.

LITHOTOMY. It is correctly noticed by Sir Benjamin Brodie, that the symptoms differ, 1st, according to the size of the stone, the smoothness or roughness of its surface, and its general form; 2dly, according to the quality of the urine. If the urine be unusually acid or very alkaline, and deposits the triple phosphate, it will be stimulating; and the symptoms of stone will thereby be aggravated; 3dly, according to the state of the bladder. Nothing aggravates the symptoms so much as inflammation of the mucous membrane; this increases the sensibility of the bladder's benighted fold, and causes a small stone to produce much greater distress and pain than a large one under ordinary circumstances. If the bladder be healthy, a very small stone may produce trifling and equivocal symptoms. The patient has rather more frequent occasion to micturate; a sense of irritation, scarcely amounting to pain, referred to the neck of the bladder, urethra, and perhaps the hypogastrium, after the bladder has been emptied. In one instance, the patient complained for many months of nothing except an occasional and trifling pain in one of the groins, and of the urine being tinged with blood after riding on horseback. Bloody urine, after any jolting exercise, is a strong indication of a calculus either in the bladder or kidney. But this symptom is often absent in the early stage, while the stone is small, especially if the patient is leading an inactive life. (See *Sir B. Brodie on the Urinary Organs*, p. 225, ed. 2.)

The pain in the groin penis, and even testicles is most severe after drinking water or exercise, when the stone suddenly falls down on the neck of the bladder. This pain "is one of the most marked symptoms of the disease. A child who labours under stone tells you of it, not in words, but in his actions. He is always pulling the end of the penis, and poking it with his fingers, even so as to cause the prepuce to become elongated. You often find his thighs with the cuticle off and swollen, as if they had been soaked in water, from the urine which has been introduced." (*Op. cit.*, p. 223.)

The degree of pain experienced by the patient depends not only on the state of the stone and bladder, but on the size, shape, chemical qualities, and situation of the calculus. "A patient with a single lithic and calculeous suffers less than one with a calculus composed externally of the triple phosphate, and the latter less than one with a mixed calculus. The oxalate of lime, or mallic acid calculus, on the whole, occasions more distress than the lithic and calculeous, probably on account of the irascibility which so frequently exist on the surface of the former; but it occasions less distress than calculeous composed of the phosphates." (See *Sir B. Brodie, Op. cit.*, p. 223.)

According to the same distinguished physician, patients with diseased prostate gland do not generally suffer more from stone in the blad-

der when it affects them, than other individuals, and perhaps less, in consequence of the swelling of the prostate gland hindering the stone from falling on the neck of the bladder. He has, however, seen three cases, in each of which there was a calculus in the bladder; complicated not only with an enlarged, but an increased prostate, and the sufferings were in three instances, terribly severe. In two of them lithotomy was performed; one of the patients died six weeks after the operation, and the other expired immediately comatose, and within a few hours.

OF CUTTING TOWARDS THE SYMPHYSE PUBIS, AND THE BILATERAL OPERATION.

I have already made reference to the plan of dividing both sides of the prostate gland, as practised in 1804 by Dr. Physick, of the United States, and nearly thirty years ago by Sir Assay Crozer, with a beaked double-edged scalpel or a double-edged gorget, in cases where the stone was large, and since occasionally adopted by Sir H. Hughes and others. In 1816, Baron Dupuytren made trial of a method which had, indeed, been suggested at an earlier period by Chamberlain and Riccardi (see *Vigues, Nouv. Essai sur Mict. Calc.*, c. viii, p. 146), which consisted in making the incision into the membranous part of the urethra, as a line with the ridge of the perineum, commencing about two inches and a half in front of the anus, and terminating an inch from it. A second incision, made parallel to the first, divided the exterior penis and the adipose cellular tissue, placed between the bulb of the urethra, in front, and the perineal body. In the third stage of the operation, the membranous portion of the urethra was laid open from the bulb to the membranous. The lithotome, or lancet, curved, was then introduced along the canal, and the latter withdrawn. The edge of the former was then turned upward towards the symphyse pubis, and the blade having been made to cut the sheath by pressing on a spring, the instrument was drawn out in this direction, so as to cut the neck of the bladder and part of its exterior portion, the deepest portion of the upper side of the urethra, the superior part of the prostate, the cellular tissue between the inferior ligaments of the bladder, and the external and crural branches in this situation. (See *Clin. Obs.*, c. vi, p. 374.)

This method was soon abandoned; it had, as the opening was situated in the narrowest part of the arch of the pubes, it must have afforded but little room for the extraction of the calculus. The venous hemorrhage would also be considerable.

In 1824, Baron Dupuytren began to employ his double lithotomes with a steel that had no serrate in any of its edges, which frequently impeded the disengagement of the lithotome from the deep groove of the instrument. The point is placed in the usual position for the lateral operation, and the steel held by an assistant exactly in the vertical direction. While the left hand keeps the arrangements of the perineal urethra, the right makes, with a double-edged knife a semicircular incision, beginning on the right, between the anus and the ischium, and terminating at the corresponding point on the left, the distance to which is passed from the anus forward being five lines. The subcutaneous-cellular tissue, the superficial tissue of the perineum, and the external point of the external sphincter being divided, so as to expose the origin of the membranous part of the urethra, the groove of the

staff can be detected with the nail of the left forefinger, which will serve for guiding the point of the knife into it. During all this first stage of the operation, care must be taken to depress the lower edge of the wound with the finger, and so keep the rectum away from the edge of the knife.

After the membranous part of the sheath has been sufficiently opened, the same finger will serve as a guide for the lithotome, which, held in the right hand with the thumb below and the two fingers next to it above, is applied to the staff with its convexity directed towards the urethra. The contact of the two instruments having been clearly ascertained, the surgeon takes hold of the handle of the staff with his left hand, and, raising its back under the symphysis of the pubis, pushes the double lithotome along its groove into the bladder.

The staff is now to be withdrawn, and the lithotome turned, so as to make its convexity face the urethra. Its blades are then made to girth the sheath, and it is drawn out, not exactly horizontally but with an inclination downward. The left forefinger is then introduced into the wound, so as to ascertain the extent of the incision made, and to guide the forceps to the calculus. (See *Dupuytren, Clin. Chir.*, t. ii., p. 340.)

Bacon Dupuytren ascribed the following advantages to the bilateral operation:

1. The great facility of its performance.
2. The situation of the wound in the widest part of the lower aperture of the pelvis, and consequently the most favourable for the extraction of large calculi.
3. This method makes a shorter and more direct passage into the bladder, whereby the requisite manoeuvring with instruments is facilitated.
4. The readier escape of the urine through the wound, and, consequently, the removal of any risk of its becoming extravasated in the cellular tissue.
5. An opening is made in the neck of the bladder and the prostate sufficient for the extraction of very large calculi, without the wound passing so far on each side as to become dangerous.

6. The evacuator does not encephalic by Dupuytren to be more safe than injury than in the common lateral operation.

7. The method is applicable in both sexes. The bilateral operation has been performed about seventy times in the Hôtel Dieu and other parts of Paris, and only six of the patients died. In that hospital twenty-six patients were operated upon in agreement with complete success. (See *Dupuytren in Clin. Chir.*, t. ii., p. 343.)

The double lithotome is now well constructed in London; and when the stone is known to be of simple case, the bilateral operation, I think, merits the preference to all ordinary plans.

A posthumous work, illustrative of Dupuytren's bilateral operation, and containing several interesting plates, has been recently published.

Mr. Liston is of opinion that no complicated machine is requisite to make this bilateral division, and that it is quite time enough to make such division when the necessity for it has been ascertained. "The single lateral incision affords sufficient room to admit of the removal of the stone in nineteen cases out of twenty, and there can be no purpose served, therefore, in always making a cut in both sides of the gland, and thus endangering the enervation of the individual."

(On *Practical Surgery*, p. 411.) I have already explained that several operations are in the habit of cutting the right side of the prostate gland with a knife when the stone is above a certain size.

TREATMENT AFTER THE OPERATION.

The position in which the patient should be placed after the operation, and the plan of leaving the wound uncovered, so as to let the urine readily escape, I have already described. Professor Jamieson, of Baltimore, who aims at uniting the wound as far as practicable by adhesion, introduces a moderately large flexible catheter through the wound into the bladder, and secures it by a soft strip of rag to the penis. The patient is laid on his side, his knees brought together, and tied by means of a soft silk bandage. No catheters are employed, but the patient must be quietly on his side for two or three days, so as to obtain the effect of a syphon from the tube. "He may, however, after some hours, if particularly desirous, turn upon his left side, yet never forgetting that the outer end of the tube must be lower than the bladder. The patient may be kept comfortably dry by using a cup or large sponge to contain the water as it drops from the tube." (See *Ampr. ed. of the Dict.*) A surgeon at Dundee has lately advocated the same practice.

Sir Benjamin Brodie had the misfortune to lose one testicular hæmorrhage. The case was that of an old man, who had an enlarged prostate and an unusually deep perineum. The blood was venous. If the incision was made low down, and not too extensive, the chance of hæmorrhage seems to Sir B. Brodie to be but small. (See *Dict. of the Theory of Surgery*, p. 298.) In one example under this position, where the size of the calculus made it necessary to cut the right side of the prostate, the hæmorrhage would have proved fatal if an assistant had not pressed the internal pudic artery against the bone with his finger for several hours. In another case, operated upon by Sir E. Home, the bleeding was first suspended by pressure with the finger, and then, as the patient was a thin person, Sir B. Brodie succeeded, with the aid of a small flexible silver needle, in passing a ligature round the trunk of that artery. Dr. Physick, of the United States, once succeeded in tying the internal pudic artery after lithotomy. (See *Ross in Amer. ed. of the Dict.*) Secondary hæmorrhage sometimes occurs after lithotomy, and probably, as Sir B. Brodie suspects, from the separation of a slough. In one such case, Mr. Kele stopped the bleeding by introducing into the bladder, through the wound, a tent of lint, enclosing an elastic gum catheter.

Mr. Key believes that the pudic artery itself is rarely wounded; but that in uniting the artery of the bulb and the superficial perineal branch often bleed profusely. If the incision be made low down in the perineum, he admits that the artery of the bulb may escape; but, from experiments which he has made on the dead subject, he infers that it is almost always divided. He does not approve of plugging the wound with lint or sponge introduced as a catheter. "The cellular membrane is irritated by it, and an unhealthy form of inflammation ensues; while the catheter being some blocked with coagulum, does not carry off the urine from the bladder. I have, however (he adds), found advantage in checking the bleeding by means of pressure made upon the upper part of the left side of the perineum by

a forked piece of lint fixed to a piece of rock-wool in this moderate warmth the deeper branches of the prostate, from which the blood sometimes comes for a long time after the patient is placed in bed, and infiltrate the bladder with masses of coagula." (*See Gay's Hospital Reports*, vol. ii, p. 19.)

I have seen the rectum wounded in three or four instances, but no serious consequences were the result. A wound of the bowel, occurring as it does close to the sphincter, does not appear to Mr. Key to be a matter of serious moment.

I shall conclude this article with the following quotation: "Many individuals (as Sir B. Brodie observes) are good subjects for the operation, and recover, perhaps, without a bad symptom, although the operation may have been very rudely performed. Others may be truly said to be bad subjects, and die even though the operation be performed in the most perfect manner. What is it that constitutes this essential difference between these two classes of cases? It is, according to my experience, the presence or absence of organic disease, especially of the kidneys or bladder." (*Op. cit.*, p. 301.) The enlargement of the prostate gland in old men, I believe with Sir B. Brodie, does not increase the danger, though it may the difficulty of the operation. I infer this from a case which occurred in University College Hospital, and in which the patient recovered without any bad symptoms, though the operation was excessively long, and a portion of the enlarged gland, which had been glyced off, fell down upon the floor.

With respect to stricture in persons, impotency, and sterility of urine, as consequences of lithotomy, I have seen two or three examples of the first. Mr. Key has not witnessed stricture as a consequence of the operation for vesical calculus. "The operation of extracting vesical calculi (he observes) when they are large, and the gland diseased, is sometimes followed by difficulty in passing the external urethra, and the formation of a stricture, through which some drops of urine escape. But in lithotomy, the incision being made through healthy structures, heals quickly by a healthy process of granulation, and finally, is therefore a very uncommon occurrence." Mr. Key has known of one instance in which impotency was ascribed to the operation. But, according to his experience, impotency of some rarely occurs in the adult. "In the young subject, partial incontinence was sometimes occur if the patient is allowed to leave his bed too soon after the operation, before the neck of the bladder is fully healed, and the sphincter has recovered its tone. Instances, therefore, are met with of young boys, who, if they contain their water unconsciously long, and it dribble away as they move about. In bed, the urine is perfectly retained. When they arrive at the age of puberty, the power of retaining it becomes increased." (*See Dr. Key, in Gay's Hospital Reports*, vol. ii, p. 25.)

Lithotomy (from *lithos*, a stone, and *tomia*, I pierce). *Lithotomus* (from *lithos*, and *otomus*, I break). The reduction of a calculus in the bladder into small pieces by means of instruments passed into that organ through the urethra, so that the fragments may be discharged through the latter tube, and no necessity remain for the performance of lithotomy. Although the history of lithotomy goes back to a very old period, the practice of it cannot be said to have been established more than a very few years. The idea of

breaking calculi in pieces was entertained in the days of Alcibiades (*Laus. Times*, p. 94, 1516), but, as my friend M. Leroy of Evreux justly observes, there is no record of the practice having been actually practiced at the period alluded to; and Alexander Benedicinus, of Verona, who published in 1533, mentions the scheme only in speculation. If it be admitted, however, that the Egyptians sometimes broke stones in the bladder, it must be granted that they have left their successors perfectly unimpressed about their method, which stood in need of being revived again. (*See Mém. de la Lithotomie*, Mém. ii, p. 113, 1804, 1805.) The earliest proposal for breaking a stone in the bladder without incision, noticed by Haller (*Med. Chir. Cur. t. i, p. 312*), was made by Santorini. M. Leroy, on referring to the text of this author, believes, however, that it relates, not to the use of any instrument like *la pierre à bras brisée*, with a drill in its centre, but merely to a smaller calculated to extract small stones through the urethra. As for the instrument of Polyzanis (*Medicina*, treating the subject entirely of *Assinus à Crusta*, M. Leroy considers that it can have had no indirect connection with the history of lithotomy, since Polyzanis only employed it for the removal of calculi lodged in the anterior portion of the urethra, and not for the extraction of those of the bladder.

Thus, down to the beginning of the 16th century, no description of any mode of breaking calculi had yet been published. It is alleged, indeed, that successful attempts had sometimes been made before that period by patients on themselves. Thus, a monk of Cîteaux is alleged to have succeeded in breaking a calculus in his bladder by introducing a rod of iron through the urethra, terminating in a chisel, and working it out, or with a hammer. Major Martin (afterwards) his own calculus by means of a file fixed at the end of an iron rod. (*Mém. de Calculus Dissert.*, p. 20, fig. 3.) M. Leroy doubts whether any complete cures were truly thus effected, and refers to some little accounts, by which it appears that Major Martin actually died of stone in the vicinity of Calcutta. Nor does the eminent lithotomist attach much importance to the statement, that Rodriguez, a physician at Mexico in 1600, broke a stone by striking it with a catheter, or, if this were really done, he adds that the success must have been either very small or trifling, and that few could have been thus cured.

Lithotomy was first seriously proposed in 1612, as a method of mechanically breaking stones in the bladder, and then only as an auxiliary to the chemical dissolution of them; the practicability of accomplishing which the writings of Fernelius and Valsartius had raised hopes of. The manner of doing it was suggested by Giraldus, a Bavarian surgeon. His apparatus consisted of a wide, straight tube, through which he passed a noose of copper wire, and a rod ending in a circle of teeth, or a spear point. The calculus was caught hold of and fixed with the wire, and then the circular saw, which was put in motion by means of a lever, was directed to perforate it. The important fact, first demonstrated by Giraldus, is the practicability of introducing straight catheters of large size through the urethra into the bladder, so as to facilitate the necessary measures requisite for the mechanical destruction of calculi.

Some years afterward, Mr. Keilston published in the *Edinb. Med. and Surgical Trans.* for April, 1667, a description of a curved instrument, which

admitted of being opened for the seizure of the stone, and was furnished with a kind of life, that acted by an alternate movement. But the two branches were found insufficient for fixing the calculus, and the bladder was not out of danger of the action of the life. Things had gone thus far when the slight-surgery, with stone bladder and a perforator (le petit à trois branches, à point et à force), were invented in 1823 by M. Civiale, exhibited by him to the Academy of Surgery, and first tried, and this with success upon the living subject by M. Civiale in the following year. In short, after a formal investigation of the merits of the several parties who led the way in these improvements, the Academy of Sciences adjudged one prize to M. Civiale for having first perfected the operation on the living subject; one to M. Leroy for the invention of the process which first succeeded in practice; and another to Baron Heurtefort for the improvements made by him in the operation. (*See Journal Éclairci, De la Lithotomie*, Paris, 1826, p. 114.)

An impartial reader, who reflects upon this history, will perceive, then, that lithotomy has attained the present perfection by the talents and ingenuity of many laborers; and that, while the merits of M. M. Leroy, Civiale, and Baron Heurtefort stand exceedingly high, the originality of the scheme, if not of the practice, is to be traced in ancient writers, and the numerous inventions of Griffiths and Eddison with great be forgotten, though not honored with the praise or commendation of any public body.

It is not my intention in this edition to describe the many instruments proposed for lithotomy, because I know that no account of them would be intelligible without plates, and some of them are no longer used. A clear and excellent description of them, illustrated by woodcuts, has been published by M. Leroy, to which I would particularly refer. (*De la Lithotomie*, &c., 8vo, Paris, 1826.)

The necessity for my entering into the particulars of the very numerous instruments constructed for pulverizing and crushing calculi in the bladder, appears now, indeed, to be needless, because the operation, as first performed on the human subject by M. Civiale with the calicle, three branches, and the drill of M. Leroy, has been nearly superseded by the more simple and expeditious method first executed by Baron Heurtefort. In this improved operation, the patient is placed upon an operation-bed or table which admits of being raised into an oblique plane. At the foot of it is an apparatus which affords a fulcrum to the instrument after its introduction into the bladder. The head of the bed, and, consequently, the fundus of the bladder, may be depressed to any extent desired, the legs which support it being hinged, and capable of folding. On this couch the patient is placed nearly in the position usually chosen for the lateral operation. A strap is passed round the shoulders and buckled to the sides of the table, and the feet are placed in slippers securely fixed at the foot of the bed.

A catheter of the usual length, with a short and rather abrupt curve, is introduced. It serves first as a sound for ascertaining the situation of the calculus, the shortness of the curve facilitating its motion in the bladder. It is furnished with a stovesick. The bladder is next moderately filled with warm water by means of a silver syringe, furnished with a ring on each side of the apparatus by the insertion of two canules, so as to

render the instrument manageable with one hand. The bladder must not be painfully distended with water, because then its action would be arrested, and the fluid would be expelled again. A pair of strong staying forceps, the opposite surfaces of which are furnished with teeth, are then introduced, and the calculus having been seized, the lower piece of the forceps is fixed to a vice at the foot of the bed, serving as a fulcrum, and the upper piece is struck with a hammer, and the calculus broken. Thus neither the shock arising from the concussion is communicated to the bladder, nor is this organ liable to be injured by the fragments being forcibly projected against its internal surface. The instruments are then withdrawn, and the fragments are afterwards washed with the urine. If any fragments remain, capable of being thus discharged, the operation is repeated from time to time, as often as may be necessary.

On the subject of the comparative advantages of lithotomy and lithotomy, it is somewhat difficult to form at present a definitive judgment, because the advocates for one or the other procedure seem to be too much under the influence of prejudice; and in France a degree of animosity has mingled itself with the question, seriously interfering with any just conclusion. When the practice of lithotomy and lithotomy first began, a few years ago, it was extolled as perfectly free from danger, and capable of superseding lithotomy altogether. This representation is incorrect. M. Velpeau declares that lithotomy is generally a longer and more painful business than lithotomy; and that he has known some patients who had been cured for stone by M. Soutterville, after having tried lithotomy under the care of M. Civiale, declare that one sitting for the latter was more painful than all the tedious proceedings in lithotomy. From what I have seen of lithotomy, as practised by Baron Heurtefort, I should say that lithotomy, with some few exceptions, is infinitely less painful than lithotomy; and that many patients, after its performance, follow their common occupations as usual. Two or three years ago the human was killed through, at my request, to exhibit his skill on three patients, in the anatomical theatre of University College, in the presence of all the students and many visitors. The manuvres were executed with surprising precision and quickness. These patients, who had undergone some previous stings, seemed to feel little pain; and, I should say, seemed to exhibit a readiness of the operation with the most cheerful readiness. Still it is not an operation always free from great suffering and danger, and is not applicable to all cases of stone.

According to the researches of M. Velpeau, one third of the patients who undergo lithotomy experience but symptoms, and it sometimes proves fatal, as we are well aware of in Great Britain. Baron Heurtefort has proved that M. Civiale lost 14 patients in 48, and M. Leroy 2 in 98; and M. Velpeau alleges, that an inquiry into the results of lithotomy, in all parts of the world, will not make the average success of lithotomy greater. M. Velpeau adds, that if all the celebrated patients be taken into the account who have undergone lithotomy, and on whom lithotomy might have been practised, the result is still less favorable; for of 20 spoken of by M. Civiale, 31 died within a year after the operation, and 19 did not recover without having experienced severe symptoms. Of 40, M. Leroy only partially cured 22. Of 50, M. Soutterville cured only 22.

upon 2. Henry M. Velpeau infers that at least 1 day out of every 10 or 12 who submit to lithotomy; but that, if a considerable number of individuals, taken promiscuously, were to be subjected either to lithotomy or lithotomy, the average number of deaths would comprise at least one sixth or one eighth of the whole of such individuals.

Yet M. Velpeau admits that, on the whole, lithotomy is a less dangerous operation than lithotomy. On this point I entertain, with him, a well founded opinion as reference to the mere operation. Who can, indeed, get down the manipulations required in lithotomy, according to the best mode of performing it, as generally to be acquired, as referred to danger, with the operation of cutting into the bladder? But this does not settle the question; for, though the operation itself may be infinitely less dangerous, the less radical nature of it, the fragments left behind, and their irritation of the bladder, which is often in a very unfavourable state to bear the continuance of such irritation; the greater chance of relapse, &c. are weighty considerations, which cannot be overlooked. Another fact, very necessary to be remembered in forming a judgment of the merits of the two operations, is, that the individuals most fit for lithotomy are exactly those on whom lithotomy would prove most successful; while those to whom lithotomy is not suitable would have a bad chance of cure from lithotomy. I would not go so far, however, as M. Velpeau, who states that they would have an inferior chance (*Nouv. Elem. de Méd. Opér.*, t. ii., p. 594), because I apprehend that, where the bladder is diseased, or is being affected with chronic inflammation, promptly taking away the stone altogether is better than breaking it, inasmuch as leaving the fragments of it behind, to keep up irritation for a time, must be particularly disadvantageous. Even were lithotomy proved to be decidedly less dangerous in its results than lithotomy, personally speaking, it is certainly not applicable to all cases. It is quite unfit for calculi formed upon extraneous substances, which serve as nuclei; for encysted or adherent calculi; for such as are excessively hard, like some of those composed of oxalate of lime; for calculi above a certain size; for patients whose prostatic, from malformation or disease, will not allow the proper instruments to be introduced. If there be several calculi, an enlarged prostatic gland, or a diseased bladder, M. Velpeau sometimes lithotomy to be at least as dangerous as lithotomy. By general advantage, however, under other circumstances, he seems uncontested, except in children; and, though more liable to be followed by relapse, on account of the fragments sometimes closing the most careful examinations, he gives the preference to lithotomy if two, three, four, five, or even six repetitions of it should be effective. (*See Velpeau, Nouv. Elem. de Méd. Opér.*, t. ii., p. 594.)

Lithotomy, as justified by Henry Henslow, appears to Sir Benjamin Brodie to have several advantages over lithotomy. It is less formidable to the patient. It requires little or no confinement; and many individuals will be induced to submit to it at an early age, who would not hesitate to submit to lithotomy until their sufferings had become excessive, and circumstances arisen to render the operation necessary. This is a point likewise insisted upon by M. Larrey, Mr. Arnott Key (*Gray's Hospital Reports*, vol. vi.), and many other writers on lithotomy. There is no danger of hæmorrhage, nor of those ill consequences which arise from an incision or lacera-

tion extending into the cellular texture around the neck of the bladder. (*On the Use of the Urinary Organ*, p. 346, ed. 2.)

The following appear to Sir B. Brodie to be the principal disadvantages of lithotomy. The patient does not obtain a cure at once; and, in many instances, the process by which the stone is crushed requires to be repeated several times. A small fragment which remains behind will form the nucleus of a new stone, a recurrence of the disease is more likely to take place after the lithotomy operation than after lithotomy, especially in those cases in which, in consequence of an enlargement of the prostate gland, the patient is unable completely to empty his bladder. The operation is only adapted to calculi of moderate size; and, when applied to larger, is either impracticable or difficult, tedious, and painful. When the stone is large, the sharp, irregular fragments lying in the bladder induce inflammation of its lining membrane, attended with severe local suffering, and much disturbance of the general system, either retarding the cure or terminating in death. The complication of disease in the kidney, or bladder, or adjacent prostate, which render lithotomy hazardous, make lithotomy also hazardous. As for the comparative pain, it is so different in different stages of each practice, that it seems difficult to form an opinion on this point. In general, after either of the operations, the patient says that he suffered less than he expected, that is, if the bladder is healthy, and the operation proceeds favourably. If the bladder be diseased, or anything occurs to render the operations difficult and tedious, the patient undoubtedly suffers severely, whether the stone be crushed or extracted by means. Sir B. Brodie then adverts to the sliding fever, shown to him about the year 1804 by Mr. Wain, which were attended to crush calculi in the water by means of the pressure of a screw acted on a hammer; and (says he) as it is now constructed, it seems capable of doing all that can be done with the hammer, unless the calculus be very large, and then the propriety of having recourse to lithotomy in any form is very undoubted. The forceps invented by Mr. Wain are highly deserving of notice, not only on account of their simplicity, but their priority to the pesseros, and some other means for crushing calculi in the bladder. It will be also found convenient, when the stone is small enough to admit of being drawn a certain way into the urethra, and crushed there. For this purpose a pair of sliding forceps may be used, fast without a screw, but to which it may be adapted to the course of the operation. (*See Brodie on the Use of the Urinary Organ*, p. 346.)

Possibility in patients, lithotomy is more difficult of execution than in the adult, in consequence of the tenderness of the works, the immaturity of the parts, and the greater elasticity of the parts. Instruments of more than two lines, or two lines and a half in diameter, cannot be introduced, and, on this account, they cannot possess much strength. (*See Velpeau, Nouv. Elem. de Méd. Opér.*, t. ii., p. 594.) However, that lithotomy is practicable in children under the age of six years is sufficiently proved by some cases recorded by M. Segalas (*Essai Méd. Acad.*, 1824), and by other examples in which that very distinguished lithotomist M. Larrey was the operator. Yet, in one instance under him, a piece of the forceps broke off, which, however, he succeeded in extracting a few days afterwards by means of another forceps. But a

fragment of the calculus now passed into the urethra, and at first could not be pushed back. At length it was reduced into the bladder by Deshayes, who then performed the biphid operation for its extraction. (*Ann. M. Leroy, De la Lithotomie, Mém., 8vo, Paris, 1836, p. 237.*) The reason why cutting into the bladder was then preferred by Deshayes to merely dividing the urethra, by the removal of the stone I do not understand. It is only justice to my friend M. Leroy to state, that he carefully admits that for children lithotomy should not be preferred to lithotomy, unless the calculus be known to be of small size. In them lithotomy is attended with little risk of dangerous bleeding, effusion of urine, peritonitis, or cystitis, and the operation is completed in a very short time. In infancy, among other considerations against lithotomy are, first, the high situation of the bladder in the pelvis, which greatly increases the curvature of the posterior third of the urethra; and, secondly, the increasing elements of success from lithotomy at this tender period of life. For a corroboration of the doctrine that lithotomy is preferable for children, I refer also to the arguments of Mr. Austin Key. (*See Gay's Hospital Reports, vol. ii.*) One of the gentleman's arguments is, that lithotomy should be generally preferred in children and elderly subjects.

In some persons, the condition of the prostate gland pushes the urethra up behind the symphysis pubis, and renders lithotomy very difficult. For obviating this impediment, H. Leroy invented a contrivance (*hydrostat de Pambou*) for rendering the passage straighter. It consists of an elastic gum catheter, which is first introduced curved, and then straightened by means of a rod (mandrin), which is slowly propelled into it from before backward with a screw. But, as M. Velpeau observes, there is danger of confining the verumontanum with this instrument, or of lacerating the posterior side of the urethra. Another instrument of this kind, invented by M. Tanchou, seems to M. Velpeau safer, as the third of it to which the bladder consists of little pieces articulated together, so that the instrument admits of being first introduced curved, and then straightened. (*Nouv. Rev. de Méd. Opér., t. iii. p. 304.*) But, now that the breaking of calculi in the bladder is usually effected with the sliding forceps, acted upon by a screw or the hammer, and such instrument is necessarily curved, these contrivances for facilitating the introduction of straight instruments are of less importance than they were a few years ago.

Among the occasional or consequences of lithotomy, that severity of the pain is sometimes dwelt upon, therefore I have already stated, the pain complained of varies in different individuals; he reasons already hinted at. Until lately, much of the pain frequently depended upon the action of straight instruments, which hardly scratched the vesicular portion of the urethra; and, as M. Velpeau remarks, the use of curved instruments will prevent this cause of suffering.

In some cases, each application of lithotomy is followed by a paroxysm of fever. It is an accident that may follow the most simple use of a catheter or bougie; it often renders it necessary to remove the intervals between the operations at the operation. In many cases, the serous coat and muscle swell, owing to the contusions and abrasions of the verumontanum, and terminations of the ureters, vesical extravasation, and

decreases in the peritonæum and scrotum, have also been occasionally noticed. I know of one case myself, in which the patient died of effusion of urine.

In some instances, cystitis, proctitis, and fatal nervous disorder arise from injury of the bladder with the forceps, or the irritation caused by the sharp angular fragments. I know of two or three instances in which the patients were seized with violent visceral spasms directly after the operation, and expired in the course of a very short space of time after their removal from the table. In other cases, excruciating of urine, or paralysis of the bladder, has ensued. In many instances, the fragments enter the urethra, and cause retention of urine, accompanied by severe suffering.

M. Blandin witnessed an instance in which the bladder was perforated, and I have heard of a similar accident in London; though, as M. Velpeau justly observes, such an occurrence ought to be exceedingly rare with a circumspect operator.

The passing of the bladder, another accident, may, in general, be avoided with tolerable certainty by not suddenly closing the lithotripter until the calculus has been felt to be grasped by it, and the instrument has been kept drawn a little way towards the vesical orifice of the bladder. The last accident, and not the least serious, to which lithotomy is liable, is the breaking of the instrument in the bladder, or with a bending of it that it cannot be withdrawn through the urethra. In the first case, lithotomy becomes indispensable; in the second, it may become necessary to cut down to the instrument in the peritonæum, and draw it with a file, before it will admit of removal. I know of instances in which such things have been accomplished.—C.

[Lithotomy has already excited the admiration and rivalry of many of the transcendental surgeons, and has been often successfully employed in the United States, where it is regarded as, in certain cases, of course, greatly to be preferred before lithotomy.]

Among those who have been emancipated with the new operation, and have done much towards introducing this improvement into the United States, Professor Gross, of Philadelphia, deserves honorable mention. This eminent surgeon has always contended that lithotomy is a difficult operation, requiring great dexterity, a perfect familiarity with the use and knowledge of the mechanism of the complicated instruments, and, without a full supply of the instruments adapted to so many purposes, and hence within the reach of but few surgeons. He has therefore protested against the notion that "lithotomy is so very easy and simple that it may be performed successfully by those who would not dare to venture on lithotomy." The frequent failures of surgeons both in Europe and America, have served to fortify his opinions, and confirm the propriety of his judgment, for even in the hands of Dr. Phœnix lithotomy has been followed by disastrous results. At the same time, Dr. Gibson does not overvalue the merits of this brilliant discovery, and he awards no undue extraordinary skill, tact, and success in the part of his own instruments in which he excels, however, he has few equals; but he insists that for success very good skill is demanded in the operation, very perfect instruments in regard to their construction and temper, but, above all, most accurate discrimination as to the cases to which it is adapted.

But lithotomy he regards as within the reach of a much greater number of surgeons, less painful to the patient, attended with little or no risk, if suitable care be used in selecting the cases and in employing the instruments; provided the patient will submit to the necessary restrictions; and he thinks, under favorable circumstances, it is certain of success.

Lithotomy proposes two objects, viz., crushing and percussion. The former of these processes is adapted to both soft and brittle stones; the latter to those which are hard and compact. Several instruments have been invented for this operation, but the two most generally preferred are those of Simon Heurteley and M. Jacobson. For an accurate description of these instruments, and a critical examination of the merits of each, reference may be had to Dr. Gibson's Institutes of Surgery, last edition, which is illustrated by very accurate drawings, which it is impracticable to give here. Preference is here given to the instrument of Heurteley, for reasons which are assigned at length. When the stone is small and has not existed very long, and if the patient be an adult having in other respects a sound constitution, and the bladder and ureters be not remarkably irritable, lithotomy may be performed with every probability of success, and in such cases should be preferred to lithotomy or lithotrity; but, on the contrary, in the absence of these favorable conditions, and especially under an opposite state of things, especially if the stone be large, hard, and rough, and the constitution have greatly suffered, the chances of recovery would be greater by lithotrity. Especially in children, no operation other than lithotomy should be attempted, and happily, in such cases, there is little to fear from the lateral operation, as the almost uniform success attending it on boys amply shows. The operation of lithotrity, however, is adapted to those frequent cases of adults and aged people who suffer from stone, while the constitution has not yet essentially suffered, nor the bladder become diseased, nor has the stone acquired a large size. The pain and danger being inconsiderable, such persons, on being informed of the advantages of lithotrity, might be induced to submit to it early, instead of delaying, as they are wont to do, until so late a period that but little chance remains of success by either operation.

For lithotrity, Dr. Gibson regards a preparation of the patient necessary by strict diet and depletion, unless it be contraindicated. He thinks it important that very low diet, with occasional laxatives, should be ordered, for weeks in some cases, as preliminary to attempting lithotrity. A very minute account of the successive steps in the operation will be found in his work already referred to, and our limits will only allow of a brief reference to his cases, which may be found in the American Journal of Medical Sciences for 1827. It will be there seen that Dr. Gibson has reported five cases, in three of which he was completely successful by a repetition of the operation of lithotrity; and in one of which he succeeded but partially, owing to the long exposure of the disease and his lithic diathesis. With a candour which, however worthy of imitation, is rarely exhibited, he gives the details of a fatal result of one operation, which he ascribes in part, and not without reason, to the ungovernable habits of the patient in regard to indulging his appetite. In all these cases he used Heurteley's instrument, though in one of them

he had previously tried that of Jacobson, at the instance of the patient, who preferred it, and, by the suffering it inflicted, he gave up his preference, and then experienced the advantages of the other, by which he was completely cured.

Dr. Randolph, of Philadelphia, and Prof. Nathan R. Smith, of Baltimore, have been successful in the use of Jacobson's instrument, although both their surgeons have since adopted Heurteley's, and now prefer it as performing lithotrity.

I have only room to add, that after summarizing his objections to the instruments of Jacobson, while, nevertheless, admitting its several points of merit and admirable ingenuity, Dr. Gibson gives the following reasons for his decided preference to that of Heurteley. 1st, In addition to its working upon the principle of crushing, percussion, it combines the important power of compression; 2d, It does not give so much pain either in introducing it or in operating it in the bladder; 3d, It can grasp a larger stone; 4th, Its hook can descend behind the prostate, and enter every corner or pocket of the bladder; 5th, It is extremely well adapted to seek out and pick up fragments; 6th, It is impossible to push the bladder where the surgeon craves it to do it; 7th, It might be used to good purpose, when well tempered, to break it, though Jacobson's chain is possibly still stronger; 8th, The facility of the groove in the female and its becoming lodged with small and small fragments, so as to give the patient pain in withdrawing the instrument, is obviated by a little practice, by moving the handle, and by slight lateral movements, washing out the fragments, and afterward crushing the remainder by a few taps of the handle. The stone window lately introduced at the extremity of the instrument, moreover, completely overcomes this difficulty.

It is but just to add, that there are some surgeons who still give the preference to the other instrument. Dr. Norris, in his last edition of *Lithon.* says, "The 'stone press' simply of Jacobson is the instrument generally used and so of this country. It combines great power of action with delicacy of form and structure; and it is by accident it should be broken, in cases in which I am not aware of even having happened, it may be withdrawn without that difficulty which has occurred with the instrument of Heurteley. Besides, it may serve as well a stone as the other, is not so liable to catch the bladder, catches more easily, and holds fairly the calculus when introduced."

In England, both these instruments have been succeeded by the recent invention of Mr. Wilson, a graphic description of which will be found in Dr. Fane's *Obstetrics of Bristol*, lately published, as also in Dr. Norris's edition of *Lithon.*

Dr. J. C. Warren has performed the lateral operation of lithotomy 18 times, and succeeded in all but two. He has only associated lithotomy once, and then with complete success.

Dr. Owen, of Charleston, divided both lobes of the prostate in lithotomy some years since, and Dr. Eys, of Georgia, did so too. Successive, using DePuy's double lithotome rather, and he treated a large stone of the maternal organ. In one of Dr. Warren's cases, lately reported in the New York *Lancet*, both lobes of the prostate were divided.

Professor Dudley, of Kentucky, has performed excellent, both in the number and success of his operations, any other surgeon in America, has

ing, as early as 1838, performed the lateral operation of lithotomy 170 times, and only one of these failed to recover by the evacuation or aggravation of other diseases. His extraordinary success has been attributed to his careful selection of cases upon which to operate, which, if true, as alleged, is highly complimentary to his discrimination and discretion; while others ascribe it to the preparation to which he subjects his patients prior to the operation, and which, it seems, consists mainly in restoring the digestive organs by suitable medication, another evidence of his science and skill.

In Dr. Bush's able paper on the subject, published in the *Transylvania Journal*, however, it will be seen that, though Professor Dudley does not claim any novelty in his operations, yet there are peculiarities, nevertheless, which entitle him, by comparison with other surgeons, to the merit of novelty. Alas! that my limits will not allow me even to indicate the features of his operation, which I regard as ingenious, new is it necessary to vindicate the claims to which his unparalleled success entitles him, as to this operation pre-empted among surgeons. I only regret that my failure to hear from him has deprived me of the ability to do him justice, by recording his skill in other departments of operative surgery to the extent he deserves.

By Dr. Flint's edition of *Desault*, lately published, it appears that Dr. Dudley invariably uses the gorget for the prostatic section; and in employing this instrument, he is almost alone in America, and yet his astonishing success might be urged as an argument in its favor. Most American surgeons, instead of the gorget, employ either the bistoury or Mr. Leitch's domestic scalpel, with a cutting edge, extending from the point to about midway of the blade; and Dr. Flint employs the latter instrument for all his sections in lithotomy, from the subincision through to the bladder. A valuable paper on the nature and treatment of calculus disorders, in review of Dr. Dudley's pamphlet, may be found in the *Amer. Journ.* for 1851.

Dr. Allen Giddens, of New-York, has performed the lateral operation of lithotomy 38 times, and has been successful in all but three; and the failure in those were attributable to complicated disease and advanced age, the cases being most unpromising. Dr. Giddens has performed lithotomy three times, and lithotomy six times, with favorable success. Three of these cases were children.

Dr. Mutter prefers a grooved staff, very slightly curved, in the operation of lithotomy, and uses a common scalpel for all the incisions. He has had great success in the treatment of stone, both by cutting and trussing. For this last purpose he prefers Jacobson's instrument.

The merit of being the first in the United States to perform the operation of lithotomy is due to Dr. Doyere, of New-York, and the successful case is reported in the *New-York Med. Journ.* for February, 1831. He employed the instrument of Civiale, and pronounced his method, Dr. J. Randolph, of Philadelphia, in the year 1834 reported six successful cases of lithotomy by Baron Heurleberg's method, in conjunction with the plan of Civiale, so that Dr. Randolph was the first in America to succeed with lithotomy. In 1836 he reports in the same journal seven additional cases, and in 1837, four more, all successful.

Dr. C. W. McCluskey, of Philadelphia, has

now performed the high operation for lithotomy nine times, and the lateral operation twenty-one times, with uniform success, five of the latter being females. He has reported lithotomy thirteen times, and has only failed in one case. Dr. J. Rhca Barton, of Philadelphia, has several times used lithotomy, but he thinks there are but few cases of stone to which it is adapted, and that but few surgeons will ever expect to this method, because of the fact it demands, and which can only be acquired by long experience and frequent operations, such as rarely fall to the lot of any individual in this country. Dr. J. Randolph, of Philadelphia, was among the first in this country to cultivate the arts of lithotomy and lithotomy, and has been more successful than any other surgeon in the United States, both in adults and children.

Dr. J. Rhca Barton has performed the lateral operation of lithotomy thirty-six times, of which he has lost four patients, all of which were unpromising cases, in their previous aspect, but the operation adorning, nevertheless, the only chance of giving possible relief, three of the patients being of very advanced age, and worn out by the long continuance of the disease.

Dr. Nathan R. Smith, of Baltimore, has operated in forty-five cases demanding the lateral operation for lithotomy, of which he has lost but three. He has also treated eleven cases of stone in the bladder by lithotomy, in all of which he has been completely successful, except in one very unfavorable case, in which no form of surgery offered any hope of success. This eminent surgeon has applied his extraordinary mechanical genius to the improvement of the instruments used in lithotomy, and with a success which has deemed this formidable operation of but its terrors to the surgeon, and greatly diminished its dangers to the patient, having constructed a staff and a knife, both of which are of great practical value.

Dr. N. R. Smith has succeeded with lithotomy in five male children, one of whom was but one year and ten months old, which is the youngest child upon whom it has ever been performed. Dr. Randolph, of Philadelphia, was successful with the same operation in a little girl of four years of age, and a boy of thirteen.

Dr. Mott, of New-York, has performed the lateral operation of lithotomy in a great number of cases, and during an extensive practice of thirty-six years, has lost but four of his patients. He exclusively employs the bistoury for the prostatic incision, and is wont to say in his lectures that he has never used a gorget on a living subject.

Dr. Parker, of New-York, has lately performed the high operation of lithotomy on an adult female with complete success. He was led to this method by the very large size of the stone, which forbade the hope of its extraction by Lisfranc's method of enlarging the urethra, and preferring, as he very properly did in such a case, the high operation to the vaginal-vesical incision.

Dr. Mutter, of Philadelphia, reports, in the *Amer. Journ.* for 1847, a case of urinary calculus extracted from a girl of nine years old, by enlarging the urethra, the incision being made with a bistoury upward towards the pubis on a grooved staff, on the plan of Dubois, and which was attended with entire success. Dr. J. Rhca Barton, of the same city, has also practiced this method with the like result, and in neither of these cases did any degree of inflammation of urine follow.

On this subject Mr. Cooper says, "Turner on

four years ago I assisted Mr. Wain, of Bloombury Square, in extracting a calculus which was nearly an inch and a half in one of its diameters, from the bladder of a girl eight or ten years old. The meatus was first gradually dilated with Weiss's dilator: the incision of urine, following the opening, after a time subsided. I have also seen a piece of spermatocæstic, five inches long, and of the usual thickness, which had accidentally slipped into the bladder, taken out with the finger, after the meatus had been dilated for two or three hours with the same instrument; and in this case no inconvenience of urine followed."

Dr. J. K. Rogers operated on a female, and extracted a stone weighing 5 oz. and 5 drachms, with complete success by a lateral incision, enlarging the urethra until it could be extracted. This is the largest ever extracted with success from the human bladder, and the patient recovered without inconvenience of urine, in any other untoward symptom. Dr. Mott extracted a stone weighing 17 oz., which is the largest on record, but the patient failed to recover. (Excerpt.)

LITHOTOMY BY THE RECTUM. Performed by Mr. Dawson, of the Liverpool Infirmary, on a little boy of three years and a half old. The case, a sacculated calculus, hanging downward, so as to be felt through the upper wall of the rectum. "A pain-bonnet, having its anterior edge rounded and very keen, was laid flat on the finger, which, thus armed and aided, was introduced through the anal opening to reach a point a short distance beyond the recto-vesical pouch, when its edge was turned upward, and a decided cut made by drawing the instrument from behind forward in the median line, through the walls of the pouch, and up to the stone, on the hard surface of which the edge of the finger was distinctly felt to grate." After a second cut, the calculus was displaced by the finger, and fell into the rectum, where it was withdrawn with Pezzer's double-screw wire. For four days urine was discharged from the rectum. On the tenth day, four ounces of urine passed in a full stream through the penis, and after this no urine was voided from the rectum. The child recovered favourably from the operation. (See *Transactions of Med. and Surgical Provincial Association*, vol. II, p. 301. To the references at the end of the article in *Lithotomy*, add *The Surgical Anatomy of the Perineum*, by Thomas Morton, late House Surgeon in the University College Hospital, 8vo, Lond., 1828.)—45.]

[LOWER JAW, EXCISION OF THE EXTREME.] (Case by John G. Perry. The disease necrotic, with several abscesses arising around the alveoli.) One of these having burst had open, the entire base of jaw bone was found to be dead, and in a great measure separated from the surrounding tissue. The removal of this bone was therefore determined upon. An incision was made along the base of the jaw, from a short distance in front of the right masseter muscle to the corresponding point on the left side. The exposed bone was covered with a raw and shining fungus, as seen on incision in the angle of the jaw, and the necrotic portion removed. On the following day the portion remaining in the right side, which looked somewhat discoloured from the loss of the support of the costal part, was removed, without difficulty. At the end of three weeks the remaining segment was taken away. After a month, the patient was able to masticate food with the aid of the tongue, which now

the moved against the upper teeth; but, as there is no reproduction of bone, the lower teeth are almost useless, and they do not meet the upper. (See *Med. Clin. Trans.*, vol. XX, art. II.)—46.]

[LUMBAR ABSCESS.] The symptoms are commonly of the following kind: pain in the lumbar region, shooting to the groin and thigh, and stiffness and pain in the course of the spine, which symptoms are exacerbated by extension of the thigh. The patient cannot stand well on the feet, and either limps in walking, or cannot walk without stooping. Any effort causes an increase of pain. Sometimes the inguinal glands are enlarged. According to Dr. Kell, of Wexford, the disease admits of being discriminated from others, even in the earliest stage, by the following circumstances: the patient cannot walk in the upright position; he always leans a little forward; he can only straighten himself to a certain point, and he is stopped by a burning pain, which is felt at the same point in the groin and knee. The patient can go up stairs more easily than he can come down, because, in the latter movement, he is obliged to hold himself up. These symptoms are usually prolonged for several weeks, or even months, by dull pain in the lumbar region.

Lumbar abscess may be mistaken for inflammation, affections of the kidney, conical, lumbar, herpetic neuralgia, pleuritic swellings, and leucost. I have shown the latter mistake recently made when the abscess had formed a small opening below Poupart's ligament. The points of difference are noticed in the article *HERPES*.

I have attended several patients, each of whom had a double lumbar abscess. Two such cases were lately under me in University College Hospital, and ultimately recovered. In the case hospital we have seen patients whose legs were drawn into complete contact with the body from the effects of lumbar abscess; yet after the discharge of the matter, the limbs gradually resumed their proper position and use. The lumbar abscess is sometimes attended with diseased vertebrae, which may either be a cause or an effect of the collection of matter. The disease, however, is frequently attended with this complication.

Chronic abscesses perpetually form in the lumbar without vertebral disease, and not well with ordinary care. (*Moys, Outlines of Human Pathology*, p. 124.)

The practice of opening abscesses connected with the larger joints is considered by Dr. M'Donell to be, in general, decidedly injudicious; but, says he, "when we consider the fatal consequences which may result from the unchecked progress of the deep abscesses, and take into the account the very great sufferings of the patient from pressure of the anterior crural nerve and its filaments, I believe this to be a case in which surgical interference is called for. The opening of this abscess, however, requires much caution. In superficial purulent collections in the lower part of the perineum, the abscess is detached, and pushed up, ward and inward sufficiently to permit the insertion above Poupart's ligament being made with perfect safety; and so in the deep collections, there is then no separation of the perineum, and the opening must be made below Poupart's ligament, and of course, with great caution." (See *M'Donell, in Dublin Journ. of Med. Science*, vol. IV, p. 12.) See also Cooper's *System* respecting the practice of opening abscesses connected with large joints, I have noticed in the article *JOINTS, DISSECTIONS OF*.—47.]

M.

[**MELANOSIS**, derived from $\mu\kappa\alpha$, black, is a term employed to signify substances, occasionally developed in or upon the tissues of the animal body, and characterized by their black colour.

Although references to melanosis of the lungs and liver may be traced in the writings of Boerhaave, Morgagni, and Haller, the first very careful descriptions of the disease were given by MM. Dupuytren, Bayle, and Larrey. The name of melanosis, which was first adopted by Larrey, who published the earliest particular account of the disease (*see Bulletin de la Soc. de Médecine de Paris*, 1806 No. 2), is still generally retained. Professor Carswell uses the term *melanosis*. Our knowledge of the disease has been of late years much extended by the speculations of Breschet, Tromsøen, Leblanc, Canstatt, and some eminent veterinary surgeons in France.

Under the title of *melanosis*, Dr. Carswell includes all melanotic formations, black discolorations, or products, described by Larrey and other authors; but, for the purpose of marking the difference in their nature, he arranges them in two groups; the first being distinguished by the appellation of *true melanosis*; the second by that of *spurious melanosis*. "Thus, (says he,) when these formations or products depend (as is the case with some of them) on a change taking place in that product of secretion, whence the natural colour of certain parts of the body is derived, or, in other words, when they constitute what is called an *idiopathic disease*, I shall consider them as belonging to the first group; and when, as is the case with others, (they originate in the accumulation of a carbonaceous substance introduced into the body from without, the action of chemical agents on the blood, or the stagnation of this fluid,) I shall include them in the second group. There are several black discolorations, which might also have been included in the present systematic arrangement, such as those observed in tissues affected with mortification, that have been subjected to the action of intense heat, or powerful excretories of various kinds; but as they have previously confounded with any of the forms of melanosis, I shall not take any farther notice of them in this place." Dr. Carswell then proceeds to describe, 1. *True melanosis*, of which there is only one kind. 2. *Spurious melanosis*, of which there are three kinds:—1. From the introduction of carbonaceous matter. 2. From the action of chemical agents on the blood. 3. From stagnation of the blood. (*See Illustrations of the Elementary Forms of Disease, Part, on Melanosis*.) According to Dr. Carswell's definition, *true melanosis consists in the formation of a solid, organized product of secretion of a deep brown or black colour, and the form and consistence of which present considerable variety, solely in consequence of the influence of external agents.*

Melanosis is more frequently observed in the cellular tissue than any other, and perhaps it is in consequence of that tissue entering into all the vascular structures and organs of the body, that melanosis is sometimes noticed in most of them. Thus, Audouin describes examples of melanotic fontanels in a great number of the ele-

mentary tissues, where it may either exist singly, or in thien with other tegular disease. (*See Précis d'Anat. Pathol.*, t. i. p. 408.) Melanotic productions may also be met with simultaneously in various textures and organs. M. Martin relates the case of a woman, in whose right inguinal glands, bladder, and testis, melanotic tumours had formed. (*See Archives Méd. et Chir. Progrès*, t. vi.) M. Albert gives another case, where the skin, the great vessels of the cellular tissue, the mediastinum, the mesentery, omentum, many lymphatic glands, the thyroid gland, and the lungs, all contained melanotic deposits.

In the cellular tissue, the most frequent seat of true melanosis, the melanotic matter is formed after the manner of secretion, accumulates in the cells of that structure, and gradually assumes the form of tumours of various sizes. A similar mode of formation is still more conspicuous in loose cellular tissue, and particularly on the surfaces of serous membranes, like those of the pleura and peritoneum.

The next variety, noticed by Professor Carswell in the seat and mode of formation of melanotic matter, is that of its deposits in the substance or subcellular structure of organs, after the manner of nutrition. Lastly, he adverts to the detection of melanotic matter in the blood, chiefly that contained in the venous capillaries, and under circumstances which prove, that it must have been formed in these vessels. (*See Illustrations of the Elem. Forms of Dis. Part, on Melanosis*.)

There are four varieties of true melanosis. (*See Abstract, Précis d'Anat. Pathol.*, t. i. p. 448.) The following names have been applied to them:—

1. The *melaniform* (melanotic infiltrate) is that in which the melanotic matter presents itself in minute points or dots in the texture of an organ; it is principally noticed in the lungs and liver.

2. *Tuberiform melanosis* (concretions melanotiques, inclusiones in matter) is the most common variety of it, and is occasionally met with in most of the organs of the body, and sometimes on the surfaces of serous membranes. "In the former situation" (says Dr. Carswell) the tumours are generally globular, and in the latter not infrequently pyramidal. They are most frequently found single in organs, and aggregated to cellulae and adipose tissue, and liver, perhaps, except liver found limited to one organ, the deposition of the melanotic matter taking place simultaneously or successively in a great many organs, or in the cellular tissue of the different regions of the body. "The melanotic tumours are most numerous in the cellulae and adipose tissues, but from their aggregated position lobular or irregularly shaped masses of great bulk." Melanotic tumours are sometimes bounded by cysts, but more frequently have no cysts. (*See Abstract, Précis d'Anat. Pathol.*, t. i. p. 451.) but are in immediate contact with the texture in which they are produced. Larrey, indeed, divided melanosis into the *crystalline*, and *non-crystalline*. According to the researches of Dr. Carswell, melanosis is perhaps never found encysted in compound tissues, or organs, as the brain, lungs, liver, and kidneys; whereas it is always so in

the cellular and adipous tissues, and sometimes on the surface of serous membranes.

3. *Stratiform melanosis* (*melanose membraneuse*) is represented by Dr. Carswell to be formed only on free surfaces, though M. Blaud states, that it is occasionally produced on the adherent surfaces of serous membranes. As the name leads us to understand, the melanotic matter is deposited in the form of strata, or layers, or of a pseudo-membrane. Its existence generally resembles that of jelly, and is enclosed either in a soft spongy cellular tissue, or fine transparent serous membrane of new formation, so that, when pressed, it feels jelly, but is not removed by the finger, or a surgical probe over it, unless some force is employed.

4. *Liquiform, or fluid melanosis*, was not described by Laennec, which, as Andral remarked, is not surprising, inasmuch as he regarded melanosis as a tissue or texture. M. Brocchi has applied this name to certain liquids of a dark colour, which seemed to him to arise from morbid secretion. In some individuals, M. Andral found in the cavity of the abdomen, after chronic peritonitis, a black fluid which he regards as liquiform melanosis. Dr. Carswell remarks, that "the appearance of true melanosis in a liquid form has in general been confined to natural or accidental serous cavities. Among the latter, the cavities of the pleura and peritoneum furnish almost the only examples in which the liquid melanotic matter has been observed, and that too in very small quantity. I have never seen it in man as a product of secretion, but have met with it in consequence of the destruction of melanotic tumours, and the effusion of their contents into serous cavities, the walls of which they had perforated. The accidental serous cavities, in which it has been found, are those which constitute cysts, particularly in the ovaries." MM. Trousseau and Le Blanc met with a fibrous cyst, as large as the fist, situated above the kidneys of a horse, and containing about eight ounces of black liquid.

Brocchi, Andral, and Carswell, in describing liquiform melanosis on mucous surfaces, especially that of the stomach, have confounded it with the black discoloration of effused blood, produced by the action of the gastric juice upon it. (Carswell.)

The largest melanotic masses are found in the loose cellular tissue behind the peritoneum, and these are always composed of many smaller ones. The largest single tumours are noticed in the liver. In the horse, masses of true melanosis have been found in the former situation, weighing from twenty to forty pounds. (Id.) It is further explained by Dr. Carswell, that the consistency of true melanosis is determined by the texture and form of the part in which it is deposited. "Thus, it is never found solid in serous cavities; for the plasma tumours, that its diffusion is not limited by dense surrounding tissues. Even in tumours attached to the serous covering of these cavities, it is for the same reason either perfectly fluid, or not more dense than animal jelly. Loose cellular tissue (also pervasively filled with the black matter) is a fluid state. In the dense texture of the ovary, on the contrary, even the smallest tumours may be as hard as cartilage, and are generally as firm as the pancreas. In the lymphatic glands, and in the brain, the melanotic tumour acquires only a medium degree of consistency, although it is generally softer in the former than in the latter, in

consequence of the capsule of the glands acting as a compressing cause.

Melanotic tumours are susceptible of a softening process, especially when situated near the surface. The skin becomes thin, atrophied, and a fleshy blackish matter, characterizing the disease, is discharged. This is what M. Blaud saw take place in an old woman, who was afterwards admitted into La Salpêtrière, and whose case is recorded by M. Brocchi. (See *Mémoires de Javon, de Physiologie Expérimentale*, t. i. p. 264.)

Melanotic tumours, attacked by absorption, or the knife, pour out blood as well as a blackish fluid. They may also throw out granulations, suppuration and heal, as was exemplified in the horse operated upon by M. Dumas, the particulars of which were published by M. Trousseau. (*Archives*, June, 1828, p. 120.) In ordinary cases, melanosis is not productive of much disorder in the economy. In the liver and the cellular tissue of many organs an excessive magnitude without growing rare, during life, is the slightest functional disturbance leading to the suspicion of its existence, pointed it does not cause any mechanical oppression. When melanotic tumours exhibit any inflammatory action, or disposition to hemorrhage, it is the cellular tissue in their structure that is the seat of these changes, just as it is the seat of cancer which sometimes invades melanotic tumours. (Blaud, in *Dictionnaire de Médecine et de Chirurgie*, t. xii. p. 264.)

Dr. Carswell and M. Andral differ from Laennec in believing the melanotic matter to be deposited first in a fluid state, and afterwards to acquire greater consistency from the cellular tissue in which it becomes developed. At an indefinite period of its formation, however, Dr. Carswell admits that the solid melanotic tumour loses its consistency, and softens; yet this change does not appear to him (as to M. Andral, as it did to Laennec, (*Précis d'Anat. Pathol.*, t. i. p. 450.) to be a vital process, originating in the melanotic matter itself, but to depend upon the destruction of tissue, which occurs, or are contained in, the melanotic tumour, and upon the simultaneous effusion of serosity. Inflammation rarely accompanies the softening process, and, when absorption and sloughing occur, they appear to be chiefly owing to the melanotic matter compressing or obliterating the blood-vessels of the tissue in which it is contained. (Carswell, *Op. cit.*)

The texture of the melanotic matter is homogeneous, void of small vessels, and a fluid exudes from it, which stains the fingers black; and it is not itself organized. In vain (says M. Andral) should we look for any trace of organization. It is merely a homogeneous substance, sometimes divided into blades, or layers, by cellular tissue, which pervades it, without belonging to it. There are neither cavities, vessels, nor fibres in it: no vessel, no nerve, is distributed in it. No characters exist entitling it to be called a texture.

As Professor Carswell observes, "when a number of melanotic tumours are grouped together, they are included in a common capsule, and separated from one another by their respective coverings and portions of cellular tissue, contained in the angular spaces sometimes left between them. It is in these situations and cellular tissues alone, that blood-vessels or nerves are to be seen. Minute arteries and veins may be observed ramifying in both, but they never pass beyond the limits of these tumours.

Large branches, and even trunks of arteries and veins are sometimes found passing over the surface, or included in the aggregated masses of melanotic matter." (See Cuvier's *Elém. d'Anat. de l'Homme*.)

With respect to the chemical composition of melanosis, M. Thénard detected carbon in it; M. Clapton, albumen and a peculiar black colouring matter; and M. Baurd accertained, that this last is analogous to the colouring matter of the blood. He also made out the presence of a particular modification of albumen in it, and the existence of phosphate of iron in it; elementary ingredients also in the blood. M. Bury made a comparative analysis of saccharine or emphyreolized, scirrhous, and melanotic formations, and he detected in these different substances albumen, fibrine, and some of the bases of which were soda, potassa, lime, and oxide of iron, in rather less proportion in the two first formations than in melanosis; and in this latter a highly carbonized principle, composing nearly one third of it. These various researches thus all tend to prove a close analogy between the elements of melanosis and those of the blood.

Melanosis is not restricted to man. It is more frequently noticed in white and gray horses than in those of any other colour. M. Ridel and Brochard have met with it also in bones of a light bay colour; and dogs, cats, rabbits, mice, and rats, are all subject to it. In horses, melanotic swellings form especially under the tail, and thence extend in greater or lesser distance within the pelvis. They may often be removed from this situation with success.

Though melanosis may occur at any period of life, and even in the foetus, a melanotic formation on the corneal film exemplified in a preparation in University College Museum would tend to prove, yet it is more common in adults and aged persons than very young individuals.

Melanosis was regarded by Linnæus as a species of cancer. (*Diagnos.*, t. ii. p. 33.) But in its appearance and progress, it is very different from the latter. The white resplendent hair and the lustrous texture of scirrhus, which yields a grating noise as the knife passes through it, present no resemblance to melanosis. The tumefaction pains of cancer; the characters of the emphyreolized tumour; the tendency of these formations to be reproduced after having been destroyed; the hectic fever and other derangements of the health to which they give rise; are circumstances sufficiently marking the difference between melanosis and cancer. The only examples, like by to have occasional such mistake, are those in which melanosis and cancer are united together. The same remark applies to tubercular disease. The cancer scirrhus of Alibert, and the cancer aneurysm of Junin, seem to have differed from simple melanosis in their tendency to be reproduced in other parts after extirpation, and in their disposition to soften and be accompanied by ulceration, and all the evils peculiar to cancerous diseases. At all events, then, it would seem as if there are modifications of melanosis, which are of malignant character, whether we adopt the doctrine or not, that they are combinations of cancer and melanosis together.

The fact of melanosis taking place chiefly in white, gray, or light bay horses, is a curious one, seeming to prove that the black matter of the accidental production is deposited in internal organs, as it were, in consequence of such colour-

ing matter not being secreted by the skin. Perhaps, however, as M. Andral observes, there has been too much disposition to generalize on this point; for M. Ridel has published instances of melanosis in horses of all colours. (See *Ann. Pathol.*, t. i. p. 475; and *Ridel, in Journ. de Méd. Vétérinaire*, par M. Duguy, t. ii. p. 272.)

Simple melanosis is not of itself dangerous; it causes no particular disturbance of the health, unless from its size it happen to press upon organs and produce functional disturbance. It may also be confused with cancer, or it may be attended with inflammation and ulceration of the texture, directly connected with it. By its pressure on important vessels, it may also give rise to dropsy.

Surgery possesses no means of disposing a melanotic tumour, the only plan of cure being that of removing the new production with a knife. The practicableness and propriety of this will depend upon the situation and extent of the disease, and the inconveniences experienced from it.—C.

[MYOTOMY. The danger of being the first surgeon in America, who performed myotomy, will may be contradistinguished from timidity, for the removal of deformity in a limb, belongs to Professor Paul F. Key, of Augusta, Geo. The case will be found reported in the *South Med. and Surg. Jour.*, for 1838; and consisted in the successful division of the Adductor Longus Femoris, the deformity and subsequent loss of motion in the thigh. The incision was made along the inferal edge of the muscle, commencing at the pubis, and extending in a similar direction five inches, and the muscle was then divided about three inches below its origin from the pubis. For the details and subsequent treatment, I have no space, but the success of the operation was complete. (See *Tasatomy*, Wm. Nuck, &c., in the Appendix.)

In Europe the division of the muscles has been practised of late for the reduction of long-standing dislocations, and for removing distortions of the spine: The trapezius, rhomboides, levator scapule, sacro lumbalis, and longissimus dorsi, have been subjected to myotomy. Some of these sections have been made in America, prompted by the success of M. Garcia, of Paris, but I am not informed of the results. Dr. Flint, of Louisville, in his *Notes on Dr. Smith's Faint Muscles*, lately reported by Lee and Blanchard, of Philadelphia, severely censures these various operations, and applies to these Mr. D.'s own epithet, in reference to the myotomy employed in cases of scirrhus, which he designates, "muscle-cutting-on-mad."

Dr. Matter, of Philadelphia, has lately divided the adductor and the posterior muscles in a lady, who for nine years had been deformed and crippled by their permanent contraction. The operation has been successful, and the lady is enabled to walk without crutches.

Dr. J. W. Schmidt, of New York, has cured a case of immobility of the lower jaw, by the substance division of the masseter muscle, after the movement employed by Dr. Mott, for opening the mouth in analogous cases, had been repeatedly used without success. The case was one which was dependent upon a contraction and rigidity of one of the masseters, consequential upon ulcerated sore throat, and had existed for twelve years. Dr. Carrochan, of this city, performed a similar operation, but a true ankylosis of the joint prevented its success.—Baker.]

N.

[NECROSIS. Dr. Alex. E. Hensch has a paper in the *Am. Journal of Med. Sciences*, for 1851, on the application of the caustic remedy in various diseases, from which it appears, that in the burning stage of necrosis, and when matter is established under the papilloma, so as to demand it, this suppurates the produce of laying open the tumour so as to completely expose the bone, or so much of it as is involved, and then applying the actual cautery as a white line, leaving the surface thus exposed. Dr. Hensch has treated several cases in this way with entire success.—Kearse.]

[NEURALGIA. Dr. J. C. Warren has had considerable experience in the treatment of neuralgia, and reports as follows:

"Supra-orbital nerve divided in two cases with success; the infra-orbital nerve divided in one time, and in six cases it succeeded; the facial nerve divided twice without success; and once the inferior maxillary nerve, which removed the disease.—Kearse.]

[NEUROMA, or Neurotic Tumours. Professor Parker, of New York, has distinguished three varieties.

1st. A very small tumour is at directly under the skin, and seeming to occupy the very extremities of the nervous filaments. They are very painful, especially if touched or handled, and require excision.

2d. Occupying the trunk of a large nerve. He has lately removed one from the ulnar nerve, just above the internal condyle, which had attained the size of a pullet's egg, having subsisted for several years. It was attributed to repeated blows received upon the nerve where it passes over the olecranon. None of the original filaments could be traced in the future it upon its surface, having changed into a pulpy mass, contained within the thickened and distended sheath.

3d. This variety is found upon the end of a stump, and is the source of the acute pain sometimes so distressing after amputation.

Mr. Cooper's article on this subject is entirely new, and is worthy of attention.—Kearse.]

Neuroma, (from *νῆρ*, a nerve) a term originally employed by Oiler to signify a tumour seated in or upon a nervous trunk. This subject has been ably investigated by Mr. Wood, the results of whose researches are published in the *Arch. Med. Chir. Trans.*, vol. iii. part 2. Tumours, connected with nerves, are subject to much variety. Sometimes, though rarely, the swelling consists almost entirely of a cyst, filled with a fluid, as exemplified in the case operated upon, and reported by Cheever. In other instances, it is a part solid, and in part fluid; more frequently it is solid throughout. In two of the cases I allude to by Mr. Wood, the tumour consisted almost entirely of a firm membranous cyst, containing a thick fluid; in the remaining, it consisted partly of fluid, and partly of a solid substance; and, in every, it was entirely of a solid texture. The consistency, colour, and appearance of the solid part did not differ in cases; and sometimes in different parts of the same tumour. In some instances, the whole was very firm and hard, of a whitish, or yellowish colour, and of a short-cartilaginous appearance,

harder than a nerve, and rather more shining. The fibres ran generally in a longitudinal direction, but are not always parallel, and the extremities of them were observed by Mr. Wood to be filled up by the substance of the tumour. In other cases, one part of the mass is solid, of a whitish colour, and sometimes appearing as such; and, in another part, there are cells of a larger or smaller size, some empty, others containing either fluid, or a solid, cartilaginous substance. Occasionally small lobes are met with, all distinct, but closely pressed together. In almost all cases, Mr. Wood observed a firm way, more or less dense, and of a shining appearance, not unlike tendon, and sometimes formed in part or entirely of altered tendons. In some cases, the one is loosely attached to the continued part by a thin cellular substance; in others, it is firmly incorporated with them; and sometimes it is attached to, or partially covered with muscular fibres. The nerve itself is sometimes found where it enters and comes out of the tumour; but more frequently it is thickened, and new and then reddened. The nerve may often be traced to the surface of the diseased part, and some of its fasciculi even into the substance, or side of the tumour. When, however, the swelling is very large, none of the nervous fibres can be traced from the trunk above to that below the tumour. The circumstance of the disease affecting only a certain number of the fibres of the nerve, seems to Mr. Wood to account for the constant power of sensation and motion, often retained in the limb beyond the tumour. That part of the nerve does continue adequate to its function, when another part of it is much diseased; it is proved by the effect of dividing the nervous trunk in the operation for the removal of the tumour, when the sensation and power of motion, which had previously been little impaired, became instantly destroyed, or much diminished. (See *Wood, Arch. Med. Chir. Trans.*, vol. iii.)

The pressure of a neuroma may give rise to local pain and numbness, and, in some instances, it has been known to excite convulsions and epilepsy. In a case recorded by Portal, a woman was freed from epileptic attacks by the removal of a tumour, which had formed on one of the nerves of the thalamus.

The generality of neuromatous swellings do not seem to be of a dangerous nature; "first, because however large the diseased mass is, or however long it may have existed, the contiguous nervous and more particularly the skin, do not become affected with disease of a malignant kind; and, secondly, because there seems to be no tendency to a return of the complaint after it has once been removed by operation." (Wood, *ibid.*)

We know from the history of nodular aneurism, however, and especially from the *Annals of this Society*, as it presents itself in the eye, that the nervous may be the seat of it. Thus, in this case, a neuroma is met with exhibiting a firm and bloody substance. Mr. Lawson removed from a middle-aged and healthy-looking man a tumour, which had occupied the pyramidal space for a considerable period. It was growing rapidly, had attained the size of a chicken's egg, and was seriously impeding the motions of the limb. On the

dissection, the tibial nerve was found intimately connected with it, the fibrille stretched over its sheath entering into, and being mixed with the substance of the growth. The nerve was cut above and below, and the whole mass excised, broken, and entire. During the stay of the man in the hospital, a tumour was detected on the front of the thigh of the same limb; here an inflammatory swelling took place, and suppurated. It was opened, but the original lump did not disperse. Within six months after the healing of the wound in the arm, the patient returned with an enormously swollen limb, and a large elastic nodule mass in the back part of it. A bleeding fungus protruded, and the disease was soon fatal. The original tumour, now in Mr. Liston's collection, is soft and bloody; but that in the fore-part of the thigh was firmness, round, larger than a hen's egg, and involved the anterior crural nerve. The diseased surface, which had been reproduced in the popliteal space, had all the characters of fungus hirsutissimus. It seems extraordinary, that, in this case, the removal of the tumour from the arm, with at least three inches of the tibial nerve, should not have been followed for an instant by any loss of power of motion or sensation in the limb or foot. (See *Liston on Pract. Surgery*, p. 294.)

The following advice is relative to the treatment, as offered by Mr. May, appears good. The tumour should be exposed, and if separable from the surface of the nerve should be removed, whether solid, or a cyst. If completely encapsulated with the whole structure of the nerve, and that nerve a small one, it should be removed with the portion of nerve involved with it. "If so complicated, and the nerve the sciatic, and the tumour a cyst, the cyst might be punctured, and the fluid evacuated, every precaution being taken to unite the wound by adhesion. In the last case, supposing the tumour to prove solid, another question might still arise; whether, the nerve being first divided above the tumour, the latter would not admit of being dissected out of its palisade limb, with more probability of safety to the patient, than if the nerve to be operated upon were left in communication with the limb?" (See *May's Human Physiology*, p. 148.)

An interesting account of the removal of a tumour of the radio-ulnar nerve of the right arm has been published by Dr. Gibber. The case terminated successfully, with a recovery of some slight use of the extended muscles of the fingers; and "the patient was dismissed with returning sensation in the back of the hand, and a tolerably free use of the arm." (See *Educat. Med. and Surg. Jour.*, vol. xxviii, p. 103.)

As is well known, when nerves have been divided in amputation, their extremities swell into firm balls of an oval shape, and frequently of the size of a nut. In certain instances, these enlargements of the ends of nerves often meet by mutual suffrages, and this probably, as Mr. Lawrence conceives, either from the bulbous swellings of the nerves being involved in the cicatrix, or passed by the contraction of it against the swollen end of the nerve. (See *Lawrence*, in *Med. Chir. Trans.*, vol. xvi, p. 333.) For additional remarks on this last subject, see *Evans*. No segregations of the appearances of the ends of nerves in stumps, consult P. G. Van Boon data que in *partibus Mendi* præsertim such appearance, vulgariter, notanda sunt. *Lupl. Batav.*, 1803, 310.—C.]

[NIPPLES. In addition to what is stated

upon the subject of sore nipples in the article *MAMMÆ*, I may observe, that the nitrate of silver is an excellent application for the cure of this painful and sometimes obstinate complaint. Dr. Hare, of Glasgow, strongly recommends its use in the following manner. Having gently, but carefully dried the nipple, the point is to be freely touched with a sharp pencil of nitrate of silver, which is to be suspended also into the chaps and cracks. The nipple is then to be washed with a little warm milk and water. The pain soon subsides, and the sore may then be healed with a little zinc ointment. Dr. Hare occasionally washes the nipple with a saturated solution of borax before and after suckling the infant. (See *Lond. Med. Gaz.*, vol. xiv, p. 871.) Sir Aschley Cooper's formula of ointment for these cases is specified in the article *MAMMÆ*. Dr. Wilson adds his testimony in favour of nitrate of silver. (*Op.*, et vol. cit. p. 733.) Pyroligneous acid, blended with yolk of egg, is another remedy sometimes preferred. (*Gaz. Medicale*,) —C.]

[NOVI MATERNI. Dr. J. Rhea Barton, of Philadelphia, has for a number of years practised an operation for these deformities, when accidental, by inserting two pins at right angles through the base of the tumour, and then encircling these with a ligature. The pins form four fixed points, beneath which the ligature may be tightly drawn, and a neck is thus formed even upon those flattened breasts. Some of the English surgeons have adopted a similar practice, but as Dr. Barton used it in Philadelphia simultaneously with the intelligence that a similar operation was performed in England, I am unable to decide the claim of priority, though it was original on the part of Dr. Barton, he having devised and executed it before he had ever heard of its being elsewhere thought of. His success has been very gratifying in numerous cases.

Dr. J. C. Warren has had extensive experience in the removal of these affections, having removed three by caustic, eight by ligature, and eighty-five by excision, all of them successful; although in one case he found it necessary to practise excision twice. See his splendid work on Tumours, for interesting cases of aneurisms by anastomoses.

Dr. A. B. Stevens prefers a peculiar form of scissor for the removal of most of the mammalian variety. He passes an armed needle longitudinally through the tumour, having attached to the extremity of the thread a thickened ligature, composed of strong bibles together until their bulk is sufficient to plug up both the openings made by the entrance and exit of the needle. In this way he avoids all hemorrhage, by drawing the needle through quickly, secluding the thickened ligature, and leaving the litter. Inflammation and suppuration take place within the cavity thus formed by the scissor, and obliterate it completely. There are this civilized surgeon remove such deformities from the face, in positions to which neither of Dr. Warren's methods were adapted, and either of them, if successful, must have sadly disfigured by the operation, while the method leaves scarcely any trace of the operation.

Dr. Mott professes, in all these cases, the employment of acupuncture with needles, heated to a white heat by the flame of a spirit lamp, a practice introduced by the late Dr. Bosc. He passes these hot needles directly

through these anastomosing tumours, some eight or ten times in different and opposite directions. Not a drop of blood flowed, the pain is very inconsiderable, and I have had the opportunity of witnessing his success in repeated instances. The effect of this asphyxiation upon the tumour is like the seton, and leaves scarcely any scar.

Dr. John Watson, of New York, has published in the *American Journal*, for 1839, a critical paper on the nature and treatment of Telangiectasis, or that morbid state of the blood-vessels which gives rise to naevus and aneurism from anastomosis. This barbarous specimen of technology was filched originally by Græfe, as a synchysis for the nervous anastomosis of the older writers; the aneurism from anastomosis of John Bell; the tumour varicose or foetiform sanguine of Boyer; and the tumour verrucosus of Dapuytren. My limits will not permit me to refer to this valuable article of Dr. Watson, which abounds with discriminating good sense and practical information on this obscure and difficult topic.—*BRISTOL.*

[NOSE. HYPERTROPHY, OR LIPOMA OF THE.—The growth, or enlargement, seems to be restricted to the skin and subcutaneous cellular tissue. These textures become thickened; and the sebaceous crypts are enlarged and disordered with their secretion, some of them to a considerable degree, and forming encysted tumours of the size of a garden pea; the cellular tissue is loaded with serosity, and, in some places, there is fibrinous deposit. The arterial capillaries are not much enlarged; but, when the part is dependent, or the circulation much excited, or the return of blood prevented by violent exertion of the lungs, the veins are much enlarged, giving the tumour a more blue and distended appearance. Different parts become affected in succession, and the mass is made up of many growths from the point and sides, of various sizes, separated by fissures, in which the sebaceous secretion, often rancid and offensive, lodges. These excrescences, though attached by pretty broad bases, are loose and pendulous." (See *Liston on Prost. Surgery*, p. 237.)

In some instances, the tumour has been known to extend over the mouth and nostrils so much, that the patient could not breathe well, especially during sleep, unless a tin tube was placed in one of the nostrils. If the tumour were not supported with the hand, it also became impeded in any liquid that was brought towards the mouth to be drunk. (See *Hey's Surgery*, ed. 2, p. 263.)

In one of the cases, under this last partitioner, the case appeared to be nothing more than an enlargement of the common integuments of the nose. The bones and cartilages seemed to be in their natural state. For, though the latter were buried in the mass, yet, when the tumour was supported, Mr. Hey could distinctly trace, with his finger, the border of the cartilages. The tumour was divided in the middle; and at the origin of this slit, he could discern a small portion of the tip of the nose. The sebaceous crypts were so much enlarged, that some of them would admit the end of a crow's quill. Mr. Hey operated as follows.—During full, with his finger, the border of the cartilaginous part, which gives the nose its proper figure, he marked out this border upon the inferior surface of the tumour, with a pencil moistened with Indian ink. Then, allowing for the thickness of the cartilage, and a

proper covering of adipose membrane, he made his first incision parallel to the line marked out. He next pursued the dissection upwards, aiming at preserving the natural figure of the nose. When the principal artery had been removed, he detached the remaining part of the adipose substance in an even surface by means of the toothed scissors. The hemorrhage, which was considerable, was stopped during the operation by the pressure of the fingers of the assistants. The patient, though a stout man, nearly fainted from the loss of blood; but, after the completion of the operation, the bleeding did not return. The case succeeded perfectly.

I have seen the operation performed in one or two instances by Mr. Liston. The following is the method preferred by him. "An incision should be made through the diseased integument and cellular tissue at the medial line upon the cartilage of the apex and columella, not however so as quite to reach them. An assistant places his forefinger in the nostril, and the surgeon, seizing the mass with his fingers, or with a small vulsellum, proceeds to dissect it off with a scalpel. The incisions must be carried pretty close to the cartilages of the ala, until the one side is cleared, the edge of the opening being well observed, and neither than, nor the cavity ever exposed open. The assistant will give warning, if the knife, at any stage of the proceeding, approaches his finger. The surface is trimmed a little, if scabrous requires, with a pair of thin slightly curved, or knife-edged scissors. A similar proceeding is observed on the opposite side, and they (the two sides) are to be made as symmetrical as possible. A few vessels may bleed: but the bleeding is easily restrained, during the dissection, by placing the small spring forceps (Græfe's) upon their mouths, or they are compressed by the point of the finger. Ligatures are afterwards placed upon them if they still persist in bleeding. Should the ligatures not hold, the cut ends (of the vessels) not being readily drawn out from the congested tissue, a fine canining needle may be passed across the bleeding point, and a ligature tied under it, the ends of both the needle and thread being cut off. Any troublesome general oozing may be stopped by plunging the anterior nares, applying a compress of lint, and a double-headed roller. Difficulty and pain are experienced in removing this dressing, and it is much better, if possible, to apply frequently and assiduously for a few hours, pledgets of lint, moistened with cold water, and after copious discharge has ceased, to substitute the tepid dressing, and thus encourage suppuration as speedily as possible." The exposed surface having granulated, the resolution may be used. Mr. Liston has removed many of these growths without any untoward accident. In only a single case, a repetition of the operation became necessary after an interval of nine or ten years. A tumour of large size had been removed from the apex of the nose, leaving the integuments of the ala slightly thickened. These afterwards increased so as to form a bulky swelling on each side of the nostril. (See *Lipoma's Practical Surgery*, p. 246.)

See also Crozier, in *Mém. de l'Acad. de Chir.*, t. iii. p. 517. *Robert Delorme, New Progress of Surgery in France*; translated by T. Chenevix-Treadwell, 4to, Lond. 1860.

Nose, Hemorrhage from, Epistaxis. In consequence of the bleeding being sometimes profuse, and incapable of being stopped by other means, it becomes necessary to plug up the nostril

and corresponding posterior opening of the nasal fossa. A loop of wire, or a strap, may be introduced along the floor of the nostril from below, backwards; and when it reaches the pharynx, it may be taken hold of with a pair of forceps, and brought forwards in the mouth, so as to allow a strong ligature to be attached to it, which is next drawn into the nasal fossa, and out of the nostril, by means of the wire, or bougie. This now becomes useless, and may be cut off. To the middle of the ligature, a loop of lint is fastened, and the ligature being then drawn more out of the nostril, fixes the lint in the posterior aperture of the nose. The nostril itself is then to be closed with a plug of lint. The dorsal of lint may easily be removed from the posterior opening, when no longer required, by displacing it with a probe introduced through the nostril, and the end of the portion of the ligature in the mouth. This part of the ligature should be kept against the roof of the mouth, by fastening it to the upper lip with a piece of adhesive plaster. A still more simple mode is to use a loop of catgut, which will pass to the back of the fauces as readily as wire, or a bougie, and one portion of it being then drawn forwards out of the mouth, will serve for the conveyance of the plug of lint to the posterior opening of the nasal fossa.

NOTE. Operation for the division of. The Taghiaroti method, which consisted in employing a portion of the integuments of the forearm for this purpose, is now superseded by the original plan, in which the excized remains of the former nose are reversed into fresh surfaces, and a flap of skin, duly shaped, is twisted, and brought down from the forehead, so as to admit of being united to them. This is the rhinoplastic art, as it is termed, from *rhis*, the nose, and *plastis*, to form, which has been practised in India time immemorial, and for many centuries in Italy, where cutting off the nose was a common punishment for certain offences, even as long ago as the period of the ancient Romans. The following is the mode adopted by Mr. Liston.—"A piece of soft leather, cut to the shape and size of the integument required to replace the apex and alae, is placed flat upon the forehead. To secure accuracy in the line of incision, its boundaries are marked on the skin with ink, in case the patient prove unsteady. The flap being thus defined, is dissected down, and kept of uniform thickness, till near the lower angle, when the incision should be carried deeply, so as to ensure an abundant vascular supply. Care should be taken, however, to avoid the pericosteum, for otherwise absorption may follow, which would increase the scar, and render the cure tedious. This narrow part of the flap, or attachment at the root of the nose, must be of some length, to allow

of its being twisted, so as to bring the integument to the exterior, when the part is adapted to its new situation; and to facilitate this, the knife should be carried a little lower down on that side on which it is intended to make the turn. After the bleeding has ceased, the flap is retained in apposition with the raw edges of the truncated organ, by points of suture. A little rolled lint is placed in the nostrils to support the flap, but no other dressing should be applied. The surgeon should be in no hurry to fix the flap; for union is most likely to occur when bleeding has ceased, and the edges of the wounds have begun to assume the glial apposition, which prevents secretion. The lower part of the wound in the forehead is brought together by suture. To the rest, lint moistened with warm water, and covered with oiled silk, is applied, the lint being renewed from time to time. As for the nose itself, the lint may be removed in three or four days, and then too perhaps some of the stitches may be dispensed with. The flap will be found sufficient, yet movable with the mouth. During the cure, contraction of the nostrils is prevented with tubes. When the nose is firmly consolidated, and a collateral circulation has been established, so as to become independent of the supply of blood through the twisted attachment, this is to be divided with a bistoury, so as to remove a wedge-like portion, and let the front of it be laid down smoothly over the root of the nose. With respect to the columella, the practice in India was to obtain this by taking a slip from the forehead, along with the rest of the flap; but Mr. Liston has found it much better first to form the main portion of the nose, as already described; and, after this has become consolidated, to raise a columella from the upper lip. The inner surface of the apex is first pared. A sharp-pointed bistoury is then passed through the upper lip, previously stretched and raised by an assistant, close to the remains of the former columella. The incision is continued down to the free margin of the lip; and a similar one, parallel to the former, is made on the opposite side of the central line, so as to make a flap about a quarter of an inch in breadth. The incision is then divided, and the protrusion of the flap removed. The new columella is then fixed in its proper place with a sewing needle, which after its head has been covered with sealing-wax, to facilitate its introduction, is passed from without through the apex of the nose, and obliquely through the extremity of the elevated flap. Then a few fucus of thermal surface to keep the fresh-cut surfaces in contact. Twisting the flap is here unnecessary. Lastly, the edges of the wound on the lip are to be brought together with the twisted suture. (See HARRIS and LESTER'S *Practical Surgery*, p. 213.)

O.

OPHTHALMIA. Professor DUGES, of Gen., has a paper in the *Smith. Med. and Surg. Jour.* for 1836, on purulent ophthalmia, which relates several cases, all of which were successfully treated by a solution of chloride of soda as a wash, one half an ounce to a quart of water. He was led to employ it, by reflecting upon the

anti-suppurative properties of the article, which are so well known to every practitioner.

Dr. DONN PIERCE, of Philadelphia, has published in the *Med. Exam.* for April 1842, a paper on the iodide of potassium in ophthalmic diseases. The dose he recommends is from two to six grains, three times a day, in a table-spoon.

nd of the compound drug of sarsaparilla. It is said to possess great potency in relieving the arthralgic pain in the eyes, temples, and head, which are often present in inflammatory affections, involving the deep tissues of the eye. In granular conjunctivitis, scleritis, trichiasis, and strabismic inflammation it proved successful.—*Rexas.*

ORTHOPEDIC. This new surgical specialty, though so lately introduced, seems to promise the successful removal of nearly all the deformities of the human body, however extensive or complicated, and a better moral or congenital. Under the several articles on Cholera, Strabismus, Wry-neck, Pterygium, Myotomy, &c., it will be seen that American surgeons have been diligently occupied in this novel department of surgery, and with a boldness and success which will compare with the achievements of any of their transatlantic contemporaries. I must refer to these several articles for the operative, improvements, and success, which have crowned their exertions, so far as they have reached me. Among those who have cultivated this branch in America, I may name Dr. Nico, Delmott, Parker, Muller, Paterson, Dixon, Eise, Gross, Fox, Smith, Davenport, Walter, Dex, and many others.—*Rexas.*

OSTEOSARCOMA. Under the head of Tumors, Excision of Bones, Jaw-bone, and Amputation, a number of cases of this disease are related, removed by operation, and among these Dr. Moir's excision of the clavicula in 1828, and the lower jaw in 1821; Dr. Sisson's operation on the upper jaw in 1825, and extirpation of the ischiopubic in 1828. Dr. Murray's removal of the scapula and clavicle together in 1833, and the repetition of this last operation by Dr. McClellan, are worthy of notice.—*Rexas.*

OVARY. This organ may be converted, 1. into a single cyst, which will sometimes acquire such magnitude as to fill the whole of the abdomen, and to cause a swelling resembling that of ascites. Cruveilhier deems it probable, that in this case the enlargement of one vesicle of the ovary has elaborated the rest of the organ, which is found to be in the state of atrophy at some point of the circumference of the cyst, and contracted with emaciation and osseous deposits. 2. There may be a single pouch, as in the foregoing instance, but from the inner surface arise suppressed growths of various dimensions, composed of a substance having the consistency of the vitreous humor, or of that of the crystalline lens, and contained in irregular fibrous cells. In the first example the fluid in the cyst is usually limpid; in the second, viscid like white of an egg, or tremulous as jelly, and incapable of being discharged by puncture. 3. The tumour may be divided into a multilocular cyst, or pouches, filled by nature at different kinds, as limpid serum, a viscid albuminous fluid, a reddish gelatinous or a bloody purulent fluid. Cruveilhier has found many of these cysts filled with a *dyctaceous substance*. Indeed, in tracing the accidental formation of tumour structures, intimate as that he has met with numerous cysts, the structure of which was more like that of a tumour than a serous membrane, and Meckel makes a similar remark. (See *Journal, Anat. Pathol.*, t. vi. p. 264.) It is not unusual to find one, two, or three of the cysts, forming a half, two thirds, or three fourths of the swelling. The cysts may be perfectly distinct from one another, or in groups, with sym-

metrisms between them. 4. *Acephalocysts*. 5. Cysts containing hairs and no albuminous substance. 6. Ovarial cysts, containing a keratin, or portion of it. Mr. Williams, of Bethleh, lately informed me of an ovarian abscess from which he removed a full grown tooth. Under Mr. Gunting, in St. George's, and elsewhere Dr. Block, of Washington, I have seen cases in which the bones of fetal subjects were extracted from similar abscesses. 7. Cysts, resting upon a cancerous base. (See *Cruveilhier, Anat. Pathol.*, t. vii. livr. four.)

This author relates the particulars of a case where an ovary transformed into many pouches, all filled with a gelatinous substance, was equivalent for ascites, and peritoneal effusion. An encysted copy of the ovary at its early stage is easily distinguished from ascites. The circumscribed form of the cyst or encysted ascites character of it, wherever situated. As for the development of the cyst or encysted ascites—a circumstance generally specified as a test—Cruveilhier regards it as theoretical and doubtful, because the cyst, as it increases in size, extends towards the central line, where there is the least resistance. But, when the cyst fills the whole of the abdomen, the criterion of its circumscribed form can no longer be applied. Then the disease will not admit of being distinguished from ascites, either by the size or shape of the tumour. The following considerations will have thrown light on the diagnosis: Ascites is seldom an idiopathic affection, being generally dependent upon organic disease of the abdominal viscera, or connected with peritonitis, whereas ovarian dropsy is almost always a local disease, frequently existing while all the other organs are healthy. In ascites the fluid always gravitates to the lower portion; hence, when the patient is lying down, the fluid descends towards the pelvis and lumbar region. The small intestines lie, as Frank has explained, in the umbilical region, the neck of the colon, and the stomach in the epigastric. Tap the belly gently with the finger, or with the ivory plate of M. Foery, and the sound will be dull in the hypogastrium and loins; and the flat or dull sound will change its place according to the varying position of the fluid in the different positions of the patient; but the sound will always be dull in the umbilical and epigastric regions. On the contrary, in encysted dropsy of the ovary, the cyst is developed in front of the bowels, so that the gaseous sound can never be perceived in front of them; an observation first made by M. Rosten. The fluctuation is never so limited as in ovarian dropsy as in ascites, but of a softer kind. In ascites the neck of the uterus remains in its natural place. In ovarian cases the uterus is not propelled down, as usually stated, but displaced upwards; and in this case, the cavity of the pelvis is filled with a tumour which is an appendage of the abdominal swelling. Ascites rarely exists without visceral disease and rupture of the lower extremities, a symptom frequently absent in ovarian cases.

When the ovary is transformed into *ovocysts*, the fluctuation is generally obscure; but in many cases, the bulgings of the tumour may be discerned, either through the parietes of the abdomen, or through the vagina, or uterus. Cruveilhier advocates the operation of paracentesis never to make a puncture unless the fluctuation be very distinct. A puncture, he thinks, can only be of service when there is a cyst of serous

fluid. "The distinctions (he adds) of single and multiplied cysts would be very important if the extirpation of the ovary were to become an approved operation. The latter should not be modified with; the former alone admitting of extirpation when their contents have been discharged, and a moderate incision is made in the parietes of the abdomen." See *Cruikshank*, vol. vi. livr. 3me.)

Ovarian cysts and tumours are exceedingly common, and are often met with in young and middle-aged women, both single and married. Dr. Barlow gives an instance in which each ovary was found connected into one or twelve cysts in a girl only ten or twelve years of age. (See *Proc. Med. Trans.*, vol. iv. p. 434.) The rate at which the disease advances, varies in different cases. Sometimes it does not attain a very large size till some years have elapsed; in other instances its augmentation is rapid. In the latter circumstances, the evolution is usually considerable. A patient under me at the *Biscuitary Dispensary*, whom I used formerly to tap about once every two months, has remained with the disease in nearly a stationary condition for the last five years, having become tired of repeated operations. I have generally found, that the danger is more in relation to the quality of the fluid than the size of the swelling. If thick, dark-coloured, and very viscidous, parietal cysts only afford temporary relief; and the repetition of it is sooner or later followed by inflammation within the cyst, and fatal disturbance.

The growth of some ovarian tumours, if in their early stage, and, as Dr. Barlow thinks, while the organic transformation of the part has not advanced too far, sometimes terminates in cure of being checked. Nay, in some cases reported by this gentleman, prove, ovarian dropsy is not always absolutely incurable. The means which he found most useful were moderate local or general bleedings, whenever pain and irritation came on; blisters, or leeches; belladonna plaster, digitalis, and iodic. In some cases, I have presented the hydrate of potash, but never with decided success. I have often known the pain and irritation relieved by cupping, alsters, purgatives, and the preparations of morphia.

Under the head of *Parovestria*, I will notice the operative expedients for the relief in case of ovarian dropsy.

On ovarian cysts, which are most commonly, but not always, of the kind called fibrous, Delpech offers many cases, accompanied by observations. (See *Chirurgie Obstétr.*, t. ii. 60, 1825.) In one of his dissections, a *stroma* and a *honey* cyst were both found connected with the ovary; a case which he deems exceedingly rare. He affirms that the cure of an ovarian cyst has never been observed, whether as the work of nature or art, and nothing can be cited that would justify any comparison with the spontaneous or artificial terminations of the *adenomata* and *honey* cysts. From the sites and dissections of ovarian cysts which he presents, he deduces, amongst other inferences, the following:—1. They are the product of a particular and accidental organization, and by no means of the gradual dilatation of the natural vessels of the ovary. 2. Observation has not yet sufficiently proved, whether, under favourable circumstances, this, is any other kind of cyst of the ovary, is ever formed alone, unaccompanied by any other change of this organ. 3. Most frequently cancer is at the same time developed;

masses of this nature existing either upon or between the layers of the cyst. Here I must observe, that the sarcomatous substances, so commonly attending ovarian cysts, are not usually regarded by British surgeons as truly carcinomatous; nor am I disposed that Delpech brings any proof of the correctness of this part of his observations. The question is also a material one, inasmuch as it has great influence on the practical point, whether parietal and other active measures should be undertaken or not! 4. The statement, that there are always several cysts, does not agree with Dr. Baillie's account of the whole ovary being sometimes converted into a capsule. (Worcester, by Warren, vol. ii. p. 315.) In their structure they are alike, though their parietes may differ in thickness; but the nature of the matter which one cyst contains may be very different from what is included in another, independently of the effect of any incidental inflammation. This remark coincides with what Dr. Baillie has said on the same point. 5. Only one cyst attains a vast magnitude, so as to fill the cavity of the abdomen; and, though the others increase, they do not exceed a middling size. 6. The parietes of the cysts do not become thin in proportion to their distension; but, on the contrary, grow thicker. 7. The cysts communicate with one another only accidentally. This disposition is sometimes retained after parietal, or some other surgical proceeding, calculated to produce an inflammation of some duration in the morbid mass; but Delpech thinks, that we have no ground for presuming that it ever happens spontaneously, and from the mere effect of distension or ulceration. 8. For the most part, the origin of the disease is quite obscure; the swelling being the only thing at first taken notice of. If pains are sometimes experienced in the situation of the ovary, or in that of the uterus, it is not till the tumour has made considerable progress, and has been of long standing. Such pains are always exceedingly vague, and only manifested by some sympathetic ailment; and it may be doubted whether they may not rather depend upon distention, than organic disease. At all events, nothing justifies the suspicion of their dependence upon inflammation. 9. Inflammation sometimes originates spontaneously in an ovary containing cysts; but, more frequently, its cause is judiciously treated. Hence arise particular symptoms, readily distinguished from such as belong to the organic disease. Dissections evince that the inflammation leads to a deposit of different quantities of concrete inflammation matter, or pus, in only some of the cysts. And Delpech believes that the inflammatory process does not readily establish itself, nor easily spread to the whole mass of an ovary in this state. 10. An ovarian cyst may rupture in such a degree, that the whole abdomen is filled by it. When the surrounding peritoneum is frayed, the cyst may become adherent to all the viscera, and to the parietes of the belly. Under these circumstances its strength is augmented by the support of all the surrounding parts; and, if inflammation be kept off, and the accompanying debilitated valvulae should not increase, the disease may remain stationary for many years. 11. The cyst may burst, and some of its contents pass into the peritoneum, where a dangerous inflammation may be the consequence. Several examples of this occurrence are recorded by Delpech. 12. The ovarian can-

hardly be recognized with certainty by the symptoms; but it is to be apprehended when the tumour augments rapidly, attended with acute fixed pain. 12. Here the project of treatment will depend upon the circumstances of the figure. When absorption of the extravasated fluid ensues, the surgeon will be prudent not to interfere much; but, if this desirable event should not take place, Delpech recommends paracentesis to be performed on the opposite side. 13. As no doubt is known that will cause organic disease of the ovary, and active medicines create serious irritation in the abdominal viscera, which Delpech describes as practically infeasible in this disorder, he lays it down as a fundamental rule in practice, that they ought not to be employed. 14. As puncturing the tumour, when a fluctuation is evident, creates a risk of lingering on peritonitis, or such hemorrhage as cannot be commanded, the operation should never be done for the first time, unless the cyst be about to give way. Delpech advises the puncture to be generally made at the side of the hypogastrium, corresponding to the diseased ovary. If, however, the fluctuation should be plain at the bottom of the vagina, and the tumour should not quit this place, at the different attitudes of the patient, he considers that this is the most advantageous situation for the puncture. If the cyst should form a projection at the vulva, so, sometimes happens, this spot should be selected. 15. A puncture may be undertaken with more confidence, when one has been previously made without all success or, provided care be taken to make the opening properly in the situation of the former. 16. In these last cases, if the patient's strength be not too much reduced, Delpech sanctions the attempt to establish an artificial fistula, by leaving a gum catheter in the puncture; but if inflammation come on, the scheme is to be renounced. 17. Le Boen's operation of making a free incision into the cyst (see *Paracentesis*) is condemned, as likely to excite peritonitis. This consequence, he claims, the more likely is follow, as experience proves, that such treatment produces extensive mortification of the cyst. 18. An inflammation of the large cavity of the cyst, he conceives, is sometimes the cause of death, even without peritonitis. 19. Everything that is known respecting ovarian cysts, proves to Delpech that they are incapable of undergoing the kind of distension which takes place in the sero-mucous ones; that, when punctured and kept open, whether they inflame or not, they subside, and are thrown into folds, but still retain their cavity, and the property of secreting the same fluid as heretofore; that, when the puncture closes, the cyst fills and expands again, sometimes with an unusual degree of pain, in consequence of the adhesions formed in its empty state; that the punctured part then generally reopens spontaneously; that the inflammation, caused by opening the cyst with a history, is not more affected in lessening or increasing inflammation, than what follows either a simple puncture, or this plan, succeeded by that of keeping up a fistulous aperture; that the practice of an incision, and its consequent perils, have most frequently only terminated in the formation of such an opening; that, in a few rare examples, in which the operation produced a complete obliteration of the cavity, the whole cyst was destroyed by exposure. 20. The project of treating an ovarian cyst like a lymphatic,

is strongly disapproved of by Delpech, with whose opinion the observation of some attempts, of this kind leads me fully to coincide. (See *Paracentesis*.)

It appears to me, that notwithstanding the possibility of the accident, Delpech overrates the danger of internal hemorrhage, from puncturing an ovarian cyst; and that he ought to have admitted the severe indigestion, the oppression of breathing, the retention of urine, and other urgent symptoms, often produced by the great pressure of the swelling, as circumstances rendering the operation indispensable for the present relief of the patient. Sir Astley Cooper informs me, that he has not met with any fatal case from piercing the cyst. In one instance, to which I was called by Dr. Egge, I punctured an ovarian cyst through the linea alba, and the fluid discharged was considerably mixed with blood; but, as the lady was not opened after death, it was unknown whence the blood had proceeded, or whether any accumulation of blood had taken place in the cyst; an occurrence, of which Delpech had such apprehensions. The reader may justly compute what has been here said with that part of the article *Paracentesis* which treats of ovarian dropsy.—C.

OVARIAN TUMOURS. In addition to the cases named in my note is contained in the body of this Dictionary, Dr. Allan Goldsmith of New York has operated successfully by excision, and the case is recorded in the *N. A. Med. and Surg. Jour.* for 1824. Since that time Dr. Goldsmith has reported this operation in two cases, one of which was completely successful, but the other failed, solely, as he thinks, because he relied upon the original ligature, which gave way some days after the operation, and the patient died, in consequence of secondary hemorrhage within the abdominal cavity.

Dr. Goldsmith relates a case in which he was concerned with the late Dr. McDowell of New York, who was the first in this country to excise ovarian tumours, and who performed the operation often, and with great success, than any other surgeon either in the old or new world. A woman who had long suffered from tumour, and had performed the operation of tapping upon herself no less than sixty times, during a few years, having learned the use of the trepan and cautery to perfection, applied to Dr. McDowell for a tumour which she supposed to be the cause of her dropsy, and begged him to cut it out. Dr. McDowell could feel a tumour of large size, occupying the site of a diseased ovary, and from its locality, proximity to the abdominal walls, and seemingly detached condition, decided upon the practicability of its removal. Both he and Dr. Goldsmith regarded the tumour as purely ovarian, and thought the *ligamentum ovarium*, that they were attended, on opening the abdomen, to discover, that what they took to be a tumour was a mass of the intestines conglutinated by adhesions, so as to present through the abdominal walls the aspect of a tumour, and utterly deceive the touch. They abandoned the operation, which might be called an exploring one, and the woman died. This case goes to confirm the doctrine taught in the text by Mr. Cooper, that if there were no other reason against the attempt to excise ovarian tumours, the difficulty, not to say the impossibility, of making out a clear and safe diagnosis constitutes in itself a sufficient objection to the operation. I have known it number of these "exploring" opera-

ties," as they are called, result disastrously like Dr. McDowell's case, for in several instances the operation has been abandoned, but the patient has died upon the table. To cut into the abdomen on an exploring expedition may well be regarded as of questionable morality, and is "most villainous surgery."

Professor Munsey, of Cincinnati, reports a case in which he performed a successful operation for ovarian disease by opening the ear, and effecting adhesion between its walls. His paper abounds with accurate and just criticism on the question of attempting the removal of these tumors. See *Am. Jour.* for 1838.—*Rem.*

[OXYMURATIC ACID.] Besides the nitrous and nitric acids, other medicines containing a large proportion of oxygen, and easy of decomposition, have been recommended as remedies for the cerebral disease; viz., oxygenated vinegar, oxalic acid, oxygenated muriate of potash, &c. (See *Cutler's Medical Treatise*, vol. i. p. 111.) But, perhaps, nothing has been put to the test of experiment with greater expectation of success, than the oxygenated muriatic acid. Mr. Cruickshank made a very early trial of it in syphilitic cases, and, as is alleged, with the utmost benefit. He also employed the nitric acid, and the oxygenated muriate of potash, and found

them eligible remedies. The latter medicine was likewise given by M. Alyon in cases of chancre and secondary ulcers, who found the good effects from it more expeditious, and more certain than those of any mercurial preparation. (*Essai sur les Progrès Médicinaux de l'Oxygène*, 4e. édit., Paris, an 12ème.) On the other hand, as much contrariety of sentiment, respecting the real and permanent efficacy of all these medicines, prevails in the numerous reports about them, as in the accounts delivered of the effects of the arsenic and nitric acid; and therefore I do not think that the reader, after the copious statements given in this book concerning the nitric and carbonic acids, (see *these words*;) would be pleased to hear again a repetition of very similar contradictions respecting the oxygenated muriatic acid. I may observe, however, that if oxygen be the principle on which the efficacy of many antisyphilitic remedies truly depends, this acid must possess greater virtue than the common muriatic acid. From me to oil, mixed in trifling quantities with sugar, may be taken in divided doses in the course of the day.

Oxygenated muriatic acid was strongly praised by Guyton de Mours as a means of disinfecting sick-rooms, and purifying the air of crowded hospitals.—*C.*

P

[PALATE, CONGENITAL FISSURE OF THE.] This presents itself in three forms:—1. Where there is a simple slit in the middle of the velum, without any loss of substance, or any fissure in the hard part of the palate. 2. With partial division of the hard palate, or roof of the mouth. 3. With complete division of the same part, in which case there is always a groove or lesser interspace between the two halves of it; and almost constantly likewise a fissure in the alveolar process and the lip. Hence, there are three kinds of operation, each of which is adapted to the particular variety of this congenital imperfection. 1. *Staphyloplasty*, applicable to examples, in which there is merely a narrow fissure in the soft palate. *Staphyloplasty*, when there is a wide rent resembling a loose substance, and unsupportive, calculated for cases in which there is a real or a seeming loss of substance in the roof of the mouth.

1. *Staphyloplasty*, pattern of M. Roux.—The apparatus required consists, 1. Of three broad British ligatures, composed of three or four strong threads. 2. Of six small curved flat needles, two for each ligature. 3. A point-screw. 4. A pair of dressing forceps. 5. A point-pointed lancet. 6. Scissors with long handles and short blades, bent laterally to an oblique angle.

The patient being seated opposite the light, and the mouth kept open, the surgeon takes hold of the right edge of the fissure with the forceps held in his left hand, while, with the right, he converts into the pharynx the point-screw, armed with a needle, the point of which is of course turned forwards. The point of the needle is then carried back to the posterior surface of the velum, and passed through it from behind forwards, near the lower end of it, and about three or four lines from the margin of the slit. The point of the needle is to be passed on as

far as practicable, and then taken hold of with the forceps. The point-screw being now removed, the needle is drawn into the mouth with the forceps, and along with it the ligature, with which it is threaded. After the patient has recovered his tranquillity and washed out his mouth, the other end of the ligature is to be passed in a similar way through the left side of the velum, and the two ends are to be brought out of the mouth at the commissure of the lips. Then a second ligature is to be applied near the angle where the two sides of the velum meet, and a third at the middle point between the other two ligatures. The left side of the fissure is then closed, depressed, and rendered concave with the ring-handled forceps, and the position of its margin begins with the curved scissors; and completed with a straight probe bluntly applied on the outer side of the forceps, and with its back directed towards the root of the tongue. Thus a slip is to be removed about half a line in breadth. Particular care must be taken to let this slip extend a little above the front angle of the fissure. The same precautions are to be followed on the opposite side; the two incisions being made to join at an acute angle above the point just now specified. It only remains to tie the ligatures. The surgeon begins with the foremost one, which is first to be tied in a simple knot. As soon as this has been duly tightened with the fore fingers, it is to be taken hold of with the ring-handled forceps, and kept from slipping, until another knot is made. The same plan is to be adopted with regard to the two upper ligatures. Finally, the two ends of each ligature are to be cut off with the scissors as usual.

No dressings are required, but the patient must refrain from talking, and as much as possible from swallowing even his spittle, which should be received in a vessel or on a handkerchief, in

proportion as it is secreted. Coughing, laughing, sneezing, &c., must likewise be avoided. Between the third and fourth days, one or both the upper ligatures may be taken away; but the lower one should be left a day or two longer. If the attempt at union fail above, which frequently happens, when the fissure extends into the roof of the mouth, the chance of it may yet be effected by the work of time, or it may be promoted by touching its edges with the nitrate of silver.

To the foregoing plan it is objected that, by passing the needles from behind forwards with their points out of sight, it is difficult to enter them with precision in the most desirable places. That when the ligatures have been introduced, the removal of the margins of the fissure, as executed by M. Roux, is exceedingly difficult. In fact, says M. Malgaigne, whatever pains be taken to stretch and draw downwards and inwards each end of the soft palate, it is always difficult, when the suture is tight with the loose margin of the velum, to make a clean and regular incision through it; and if scissors are employed, there is a risk of cutting the threads. See *Med. et Nat. Oper.*, p. 472—473.

M. Syme's Method.—The surgeon seizes the left margin of the fissure with a pair of sea-sawing forceps held in the left hand. With the right he holds the needle with the dressing forceps, the sharpness of the needle being turned towards the free edge of the fissure. The needle is introduced from before backwards on a level with the upper angle of the slit, nearly three lines to the outer side of its free edge, and it is pushed on till the whole of its curved portion has traversed the velum. Its curve points its point to be directed backwards and inwards, and to become visible in the fissure. The operator now relinquishes the free edge of the velum, and with the same forceps, which were to keep it tense, he takes hold of the part of the needle projecting backwards. A slight traction backwards and towards the side opposite that of the entrance of the needle, serves to disengage its head; and the needle is then brought from behind forwards through the fissure, and near out of the mouth, together with the ligature connected with it. Another ligature is now passed in a similar manner through the right lip of the fissure. The second needle draws a ligature after it in the form of a noose, which is detached from the needle, and the deep end of the ligature passed through it. A second or a third noose is made in the same way according to the extent of the fissure, care being taken to enter each needle about three lines from the free margin of the division. The tissues being now drawn down to keep the ligatures out of the way of the lips, the left side of the fissure is once more taken hold of with the forceps, and its edges removed with a bistoury, which is passed through the soft palate one line above the angle of the fissure, with its back towards the end of the mouth, and its edge downwards. The same proceeding is adapted to the other side, and the ligatures tied.

Mr. J. E. Smith's Method.—This gentleman, a surgeon in the United States, employs a very simple needle, mounted on a handle, and with a curve, the radius of which is about half an inch. At two or three lines from its point is a slit open at its posterior end, extending along one side of the needle to its middle. In front of this eye or slit the needle is broader than be-

hind, which facilitates the passage of the pin of the instrument which follows. The eye being laid the ligature introduced through it, the curved portion of the needle is carried out the mouth beyond the palatine fissure, and its point carried behind the middle of the velum, and passed through the latter part even behind forwards. As soon as the point of the needle has passed sufficiently forwards, and the ligature in the slit of the instrument is passed, the thread is to be taken hold of with a compression, and having been discharged from the eye, or slit in the needle, the latter instrument is withdrawn. A second ligature is to be passed half an inch higher up, and it encloses a third, at an equal distance from the second. With the ends of the ligatures passed through the urethra, this part is now drawn forwards, and the fissure in the soft palate having been thus brought nearly into a horizontal position, its edges are to be cut off with scissors, either straight or curved laterally, or with the aid of a knife and a pair of forceps. After the ligatures have been tied, they are to be cut off near the knots.

Mr. Liston's Method.—A narrow sharp-pointed handle, held by the farther end of the handle, is introduced through the edge of the fissure at its anterior margin, and run back to the apex of the open half of the urethra. This may be tied hold of, and made tense by means of the sharp-pointed forceps. The same proceeding is repeated on the other side. The ligatures are introduced with needles, fixed in handles, and of different sizes and curvatures, the eyes being near their points. They are passed through the velum about a quarter of an inch from its free edge and towards it, and through two-thirds of its thickness. Each needle carries a double ligature, the noose of which is caught by a blunt hook, and pulled out into the mouth, while the instrument is withdrawn. A second and smaller ligature is carried through opposite to the first, and by means of this second thread, the first and double one is brought through. By a repetition of this plan, two, three, or more pairs of interrupted suture are made. After the edges have been put together by one of two points, so difficult will be experienced in carrying others through both edges by means of a more curved instrument in a handle, or by the use of a small needle carried in the points of a pair of strong and well-pointed forceps. Before the ligatures are finally secured, the parts being put upon the stretch, an incision should be made on each side towards the alveolar ridge through the anterior surface of the velum. By this method, Mr. Liston feels that the edges may be more easily brought together, and the strain is taken off the threads, so that there is less risk of their tearing their way out by absorption. Mr. Liston terms the operation very liable to failure. (*On Practical Surgery*, p. 472.)

Staphyloplastic.—One modification of it consists in facilitating the approximation of the edges of the fissure to one another, by an incision made along the palate, on each side of the division. The ligatures, arranged in the usual way, will now draw the margins of the fissure together, when, without such incisions, this object would be impracticable. This method is followed by Dieffenbach.

The Indian staphyloplastic consists in raising up a flap of soft parts from the roof of the mouth, and twisting its pedicle round, so that

the flap may be adapted, by means of suture, to the loss of substance in the palate. I do not deem it necessary to enter further into the various plans of repairing deficiencies and apertures in the palate, on *Hippocratic* principles. The mode of proceeding in different cases must be decided by the particular nature of them.

[**PATKILL.** Dr. Mitter, of Philadelphia, has performed *Fischer's* operation for displaced patella with perfect success, and in another case he has replaced the patella by a new method. As this gentleman is about publishing a new work on Surgery, he will furnish the details of these and other operations, for which my limits are inadequate.—*Ratio.*]

[**PERIODITIS.** Inflammation of the periodium. Is sometimes an idiopathic affection excited by cold, or mechanical injuries, constitutes a secondary complaint, produced by various deranged states of the general health, as by rheumatism, scurvy, and the abuse of mercury. In the idiopathic form, the treatment should be antiphlogistic, comprising bleeding, leeches, calomel, saline, aperient, and diaphoretic medicines, and purgatives and frictions. In the chronic stage, blustering, and light tonic alterative medicines, are indicated. If no relief be experienced from these, mercury, or incision down to the bone, has been found to answer. The treatment of perioditis occurring as a symptom of some constitutional disease, differ according to the nature of the original complaint; calomel and opium, Aqueous of potash, with sassafras and colchicum, are sometimes, whose usefulness in such cases is universally known.—*C.*]

[**PESSARY.** *M. E. Chéque* gives the particulars of a case, in which a pessary was met with in the body of an old woman, the broad lower end of which had perforated the rectum, while the upper narrower one had produced ulceration of the vesico-vaginal septum, and entered the bladder. These fourths of the interior of its wider part were filled with a white crystallized concretions, strongly adherent to it, with brownish stercoraceous matter between the large crystallizations. The upper narrower end was incised with a section, of irregular shape but smooth surface, and yellowish colour, composed of uric acid. (See *Jules Chéque*, in *Pathol. Chir.*, p. 100. 4to, Paris, 1833.)—*C.*]

[This case will probably be tried by these American surgeons who so frequently oppose the use of pessaries, as an argument of harmlessness on their side of the question. But such extreme cases prove nothing on either side; except that these instruments, like all others, may be misapplied. In the *Scottish Medical Journal* there is an article by Professor P. F. Evis, protesting against the use of pessaries under any circumstances, and citing numerous medical authorities against their use as useless and mischievous. While in the Philadelphia practice of Midwifery by Dr. Meigs, the reader may see an elaborate argument as to their form, not as a universal remedy for prolapsus uteri, but as a valuable auxiliary in certain cases. Dr. Meigs gives the preference to the globular form, and to the metallic material for these instruments. The primitive and most ancient form was that of the globe, for *Hippocrates* recommended the pessaries previously covered in wine, as a pessary. Dr. Physick, while a pupil of John Hunter, employed a billiard ball of ivory, and the only objection was its weight. He ever afterwards employed the

globular form, but preferred a hollow globe of silver covered with gold. Almost every variety of form and material has been used by different surgeons, and to vary the seat and shape of pessaries in different cases is found indispensable.

Dr. Saml. K. Jennings, of Baltimore, after extensive experience in the treatment of prolapsus and other forms of uterine disease, has recently proposed a new form of pessary, which he thinks is adapted to rectify all the evils ascribed to those instruments, and better fitted to fulfil all the requisite indications. His own description of the instrument is here inserted, so far as is necessary to explain its principles.

"If we duly consider the anatomy of the organs to be supported by a pessary, we cannot fail to perceive, that the instrument, if it shall have good protection to a physiological adaptation, ought to fill the cavity of the vagina without inconvenient distention, either lateral or longitudinal. It should reach about four inches above the os calcum, and should have a neck, by which the entire weight of the organ and instrument may be made to rest upon a bandage or cushion fitted for that purpose. Its upper extremity should occupy the cul-de-sac, filling it above the neck, and present a suitable cavity on its anterior side, into which it shall receive the neck of the womb. This last named adjustment will secure to the uterus the necessary elevation, and to the bodies of the organ an inclination in conformity to its natural angle with the vagina; and the neck, when received into the cavity provided for that purpose, will subserve to keep the instrument in its proper position. On the anterior side of the instrument there should be a sulcus or groove of sufficient capacity to protect the urethra. This groove will also enable the patient at any time, very conveniently, with the end of the forefinger, to ascertain whether the instrument retains its intended position; and it will make a channel for the exit of the secretions.

"A pessary made to correspond to these views, should have its body about three and a half to four inches long. Its shape should be ovate-oblong. Its male part should measure about two inches in length, and from an inch to an inch and a half, or an inch and three-fourths, in some instances two inches and a fourth in breadth. Its lengthened or smaller end should measure about an inch and a half or an inch and three-fourths in length, and three-fourths of an inch or an inch and a quarter, or an inch and a half in breadth. To the small end there should be attached a neck or stem, about an inch and a half in length, having at its lower extremity two circular buttons, seven-eighths of an inch in diameter, and one-fourth of an inch apart, for the purpose of receiving and holding the bandage which is intended to sustain its weight. At the upper or larger end of the ovate part, and on its anterior side, there should be an oval cavity, as large as the size of the instrument will admit. The rotundity of the ovate end, aided by this cavity, will sufficiently fill the cul-de-sac, and compress the neck to resume and retain its natural position and angle; and the neck thus supported by the cavity will in turn prevent any change in the position of the instrument. Its lower or lengthened end should be adapted on its anterior side for the protection of the urethra, and there should be a circular indent in the upper posterior side of the ovate cavity, to make room for the neck."

Dr. Jennings has published a brief treatise on the subject, which explains his peculiar views. In old cases of psoasitis, complicated with more or less retroversion of the uterus, he alleges that this latter displacement is attended with a subacute inflammatory condition of the parts, resulting in adhesions, sometimes extensive and obstinate, corresponding to the extent and time of pre-existing irritation. These adhesions resemble tumors, or excruciations per rectum, by the rigidity of the contractions, and he insists that all attempts to maintain the uterus in situ, even after it is replaced, will be unavailing until these abnormal adhesions and contractions are broken up. The manipulation he recommends for this purpose is performed with the finger in the rectum, making lateral pressure in the necessary extent, and repeating the process at suitable intervals, until the uterus can be elevated to its normal state without pain or inconvenience. Meanwhile he advises general and local depletion, corresponding to the pathological state found to be present.

In the *Am. Jour.* for 1842, Dr. J. P. Meigs, of Virginia, reports a highly interesting case of *Metrorrhagia*, connected with malposition of the uterus, with adhesion of its cervix and os to the corresponding portions of the vagina. — *Revue.*

[*PNEUMOMASIA DOLENS*. A swelling of the lower extremities, the consequence of crural phlebitis. It is mostly seen in pariparous women, but sometimes in other women, who have not been pregnant; and now and then in the male sex. I have had two male patients of this kind; one of them was a soldier, in a military hospital at Cambray, during the war; the other was a man who died in the Queen's Bench Infirmary. In the post mortem examination, the external iliac and other veins were found considerably obstructed. Dr. Davis, of University College, was the first who proved by dissection, that *pneumomastia dolens* depended on inflammation of the iliac and femoral veins. (See *Med. Chir. Trans.*, vol. xii. 1823.) One of his cases occurred in 1817, considerably prior to the examples recorded by M. Bonilhard in 1828. The latter states, however, that Chaussier and Meckel had related still earlier instances of *pneumomastia dolens*, in pariparous women; where the crural veins had been found inflamed and obstructed. (See *Archiv. de Med.*, t. ii. Jan. 1823.) — *C.*]

[*PHYSIOMASIS*. Dr. Ewe, of Georgia, has several times performed the operation for *Physiomas* on the plan proposed by M. Cloquet, making small incisions on each side of the lesion, after having retracted the skin as far as possible. — *Revue.*]

[*PNEUMOTHORAX*; (from *pneuma*, and *thorax*.) An accumulation of air in the sac of the pleura. Air may pass into this situation either from the lung or bronchial tubes, or through the parietes of the chest. An example of the former is afforded by the rupture of the pleura pulmonalis, by the bursting of a tubercular cavity communicating with the bronchial tubes; and an instance of the latter is afforded by the *parietal hernia* consequent to certain penetrating wounds of the chest. Air is also stated by M. Astruc to be sometimes generated within the sac of the pleura. This last occurrence is rare; and Dr. Haughton considers that the doctrine of *pneumothorax* being ever formed by the decomposition of a phlogistic effusion, is by no means satisfactorily proved. (See *Treatise of*

Fract. Abdom., art. *Pneumothorax*.) According to Lassarac, the pleura, in some very uncommon instances, secretes air; and the air so produced is occasionally accompanied by an effusion of serum or purulent fluid. "This variety (Dr. Haughton remarks) has not been decidedly established by the dissection of other patients, and we record its existence merely on his authority, and on that of Astruc, who relates a case of it. (*Chir. Med.*, t. ii. p. 517.) It is, however, this origin was not unquestionably proved." (*Op.* 181.)

In cases of *pneumothorax* produced by the bursting of a tubercular abscess into the pleura, the existence of a large cavity, or even of numerous tubercles, is by no means essential. Dr. Haughton has known *pneumothorax* arise, where the cavity which led to the perforation was smaller than a nut. Astruc and others met with cases, where only five or six tubercles existed in the lung; and Dr. Forcand had one remarkable case, where it followed the bursting of a single tubercle which had been found scarcely larger than the pleura, all the rest of the lung being perfectly free from tubercles. The passage of the contents of the tubercle, and of the air, into the sac of the pleura, which mostly happens on the left side, always leaves on its exit a track of acute phlebitis. If this be not speedily mortal, the effused lymphatics become organized, and form a fibrous membrane, enveloping the whole surface of the compressed lung, as a deposition upon the pleura, which lies under it, of its natural thickness. The lung itself has compressed and flattened against the spinal column and mediastinum; and in cases which have lasted some time, it eventually becomes reduced to about one-fourth of its natural dimensions; and then, if removed, its substance is found to be so condensed as to prevent the appearance of what is termed *cardiac lung*. The perforation, by which the air escapes from the lung into the sac of the pleura during inspiration, becomes permanent; and as for the air itself, if it is discharged by passing into the thorax, it is found to be generally an freedom gas, little different from the atmospheric air, whence it was originally derived. (See Dr. John Darg, in *Med. Trans.* 1824; and Dr. Apjohn, in *Trans. of Assoc. of College of Physicians, Dublin*, vol. v.)

In the majority of cases, the air, although it has a free passage into the sac of the pleura, cannot return into the lung during expiration, owing to the valvular disposition of the bronchi; and if this impediment did not exist, still the air could not return into the lung, because the bronchi are full of air. The fluids in pleura, exactly in the same manner as the value of the bellows prevents the air from going out by the aperture through which it entered. The consequence is, that the air exerts a pressure within the sac, and that such pressure continues to increase so long as the communication remains open. The space occupied by the air is much greater than that occupied by the other fluids; and it seems probable to Dr. Haughton, that the chief part of the pressure must be produced by the air, and not by the other fluid.

This species of *pneumothorax* is almost invariably preceded by the usual symptoms of phthisis, cough, hæmoptoe, emaciation, night sweats, &c. Then, at the moment when the air first invades itself into the sac of the pleura, the patient is sometimes conscious of the occurrence, or has a sensation of swelling

having suddenly given way in the chest. Emphysema, as Dr. Houghton observes, being constantly an accompaniment of this variety of pneumothorax, the symptoms of the latter are necessarily joined with those of the former. Hence the insufficiency of the rational symptoms for the diagnosis. "We find the symptoms of emphysema set down as dyspnoea and pain, (cough and expectoration,) distention on one side, dilatation of the ribs, displacement of the heart, depression of the diaphragm, and hectic fever?" (See Emphysema.) The same catalogue precisely makes up the rational symptoms in pneumothorax.

The dyspnoea and pain which immediately follow the bursting of the tubercle, and the first entrance of air into the sac of the pleura, are nearly simultaneous with the sensation above described; but they are still more constantly present, and therefore (as Dr. Houghton observes) of more value in the diagnosis. Yet pneumothorax has been known to take place without either violent pain, or sudden dyspnoea. (Townsend, in *Trans. of Dublin College*, vol. v.; and Houghton, in *Gallien Journ. of Med. Science*, No. 2.)

The dyspnoea, which usually continues during the whole course of pneumothorax, is more urgent and distressing than that attending chronic emphysema. This is accounted for by the great elasticity and condensation of the air, so that even the greatest expansion of the thorax in inspiration can but very partially overcome its reaction, and therefore dyspnoea, resulting from the compression, is thus less trivially mitigated. (See *Cyclop. of Pract. Med.*, art. *Pneumothorax*.)

Different writers give different accounts of the side on which a patient with pneumothorax prefers to lie. "In emphysema (Dr. Dumas observes) the patients commonly lie on the affected side; and in pneumothorax, on the sound one." (*Ed. Med. Journ.*, No. 28, p. 327.) In relation to this point, Dr. Houghton admits the fact, that, in emphysema, the dyspnoea is caused by the pressure of fluid alone, and that it is chiefly for the purpose of relieving the mediastinum, and opposite lung, of its weight and pressure, that decubitus takes place on the affected side. (See Emphysema.) But, he observes, in pneumothorax, the compression of the internal organs is as complete, if not more so, although caused by air; and, if the weight of even an inconsiderable quantity of fluid should be added to them, already suffering under this great compression, the patient will instinctively obviate this by lying on the affected side. According to Dr. Houghton's experience, this position, *scilicet* prona, is always preferred.

The side where pneumothorax occurs, is but slightly or not at all elevated during inspiration; and, on being measured, generally is found to be larger than the opposite one. But in other disorders, and in emphysema, the intercostal spaces are widened and occasionally protrude beyond the level of the ribs. But the column of the intestines of the side, sometimes noticed in emphysema, is not observed in pneumothorax, although M. Louis and others have remarked an anomalous state of the corresponding arm.

According to Dr. Houghton, less compression seems requisite to produce displacement of the heart and depression of the diaphragm than dilatation of the ribs; for the latter has less effect where the heart has been thrust considerably out of its place, and a sensibly thinner pro-

duced in the corresponding hypochondrium by the depression of the diaphragm.

In addition to the foregoing rational symptoms of pneumothorax, is the tubular distillation, which always speedily follows the escape of air by perforation of the tubercular cavity, and is in fact the fever of pleuritis. If the immediate consequences of it are not fatal, this fever subsides into the hectic of pleuritis, which existed previously to the bursting of the tubercle.

The physical symptoms of pneumothorax are highly deserving of attention. Whenever air and fluid coexist together in the sac of the pleura, if the fluid be shaken strongly, the splash of the liquid against the walls of the thorax is often distinctly heard by the patient, or by any one who places his ear on or near the chest. This sound can only be produced where air and fluid are both present; if either is absent, no splashing sound is heard. The action of carefully shaking the trunk to acquire this information, is termed *excussio*.

One of the positive signs of pneumothorax is a metallic tinkling, or ringing sound, detected with the naked ear, and still better with the stethoscope. It is compared to the sound occasioned by the dropping of a pen into a large wine-glass, or touching gently a concave porcelain vase with a quill. It is audible during coughing, speaking, and sometimes during respiration.

The general result of pneumothorax from perforation of the lung by tubercle, is death. Lember is well known to have believed in the possibility of the cicatrization of tubercular cavities; and hence it has been conceived, that, in this case, a recovery is not absolutely precluded.

The chances of it, however, appear exceedingly poor. Even Leconte himself admits, that the effusion of air cannot exist for any length of time, without giving rise to very severe symptoms, and even death. M. Louis only speaks of the result, with the view of calculating the time which elapses between the period of perforation and death. (*Recherches sur le Phtisie*, p. 823.) Dr. Stokes relates a case, which lasted five months, as the longest at that time on record. (*Trans. of King's and Queen's College*, vol. v.) and Houghton, in *Cyclop. of Pract. Med.*

These circumstances are very discouraging to the performance of any operation for the discharge of the air. Cases will occur, where resection, leeches, nistyles, &c., will fail to prevent the dyspnoea from increasing to such a pitch as to threaten the patient with suffocation. Then the only means of cruetting the patient to live longer, is making a small puncture in the chest. This is mostly followed by great relief, which, however, is only temporary. The failure of dissection is ascribed by Dr. Houghton to the readiness with, in such cases, the false membrane and pleura have to inflame and become gangrenous.

Pneumothorax, from the bursting of an abscess of the lung, is rare; and when it happens, the emphysema is generally circumscribed. Dr. Houghton suggests, that this must have been the case in the examples of recovery recorded by Dr. Archer. (*Trans. of King's and Queen's College*) and Dr. Haysborne. (*Edinb. Med. Journ.*, No. 61, p. 6.)

[POLYPUS. Professor Gibbes, of New York, has published in the *New York Med. Gaz.* (for 1841), a report of a case of polypus uteri, which is removed by cauterization, and which he at-

passed by the grounds of his preference of the knife to the ligature in this disease. An abstract of this valuable paper may be found in the *Amer. Journ.* for 1841.

Dr. John Watson, of New York, has published in the *Amer. Journ.* for 1842, an elaborate paper on the pathology and treatment of polypous tumours of the nasal fossæ, with other observations on tumours, in which the whole subject is illustrated by reports of interesting cases, and which will be found to possess great practical value.

The following case of nasal operation for polypus will be found to possess the merit of originality, and is very creditable to the surgeon, Dr. Meigs, of New York:—

The case was a large fibrous tumour from the nasal cavity of the left side. The operation consisted in making an incision through the soft parts, commencing a little on the nasal side of the internal angular process of the os frontis, and extending downwards to the upper lip, which was divided upon three lines, from the angle of the mouth. Two flaps were then reflected, the internal including the cartilaginous parts of the nose, and the flaps covering the os frontis of the left side; the external laying bare the bone as far as the infra-orbital foramen. The anterior part of the tumour was now somewhat more distinctly seen, and the nasal cavity was further exposed by sawing, vertically, through the os septi as far as the transverse suture, so as to avoid the descending plate of the ethmoid. The superior maxillary bone was now divided in a line from the upper part of this os to a point opposite the second bicuspis tooth, and on a level with the base of the nostrils. Another section was made from the termination of the last, extending horizontally inward towards the corner. The osseous parts comprising the os max., a considerable portion of the superior maxillary bone, and the os sphenoid inferius were then detached. The contents of the tumour were partially separated, but the disease was so extensive, that a part had to be removed through the anterior opening, before the posterior attachments could be liberated. These having been detached, the larger portion of this extensive disease, which passed into the pharynx and completely plugged up the posterior nares, was removed by introducing through the nostril a large curved scissor and forceps, and seizing the mass as it descended into the pharynx. (See *Amer. Journ. of Med. Science*, for January, 1842.)

Dr. John Watson, of New York, has published in the *Amer. Journal* for April, 1842, an essay on polypous tumours of the nasal fossæ, to which I can only refer the reader. It abounds in valuable practical information on this topic.

Dr. Joseph Parich, of Philadelphia, was successful in removing polypus from the posterior nares, which he effected by ligature in female He cases, at the Pennsylvania Hospital.

Professor Ke, of Georgia, reports an operation in the *South. Med. and Surg. Journ.* for 1836, in which he removed a large fibrous polypus from the base of the cranium, after repeated unsuccessful attempts to remove it. The tumour filled the anterior and posterior nares, detached the alaræ, protruded the eye, depressed the entire brain, and tragically deformed the cheek of the right side, and it had projected into the left nostril, while it descended the throat posteriorly, and crossed upon the palate, which had

been partly removed by a previous operation. It was found intimately adhering to the basilar processes of the occipital and sphenoid bones, and to the internal plate of the pterygoid process. This intricate proceeding was completed by the entire removal of the tumour, and the patient recovered with very little deformity of the face, and suffering only from the fissure in the palate which became necessary in the operation, and which failed to unite, though the interrupted suture was employed for the purpose. The operation of staphyloplasty is recommended, as the patient has recovered his health, is an industrious farmer, and since married.

Dr. E. H. Dixon has contrived an instrument for the removal of polypus of the uterus by ligature, which, from its simplicity and adaptation to the purpose, possesses great merit. A paper on the subject, with a report of cases in which it has been successfully used, may be found in the 15th No. of the 22nd vol. of the *Boston Med. and Surg. Journal*.—*Revue.*

[POTRICK. The late Dr. Joseph Parich, of Philadelphia, was remarkably successful in the treatment of Ferrigo or Tinea capitis, and his son, Dr. Isaac Parich, has politely furnished me with his mode of treatment. He shaved the scalp as closely as possible, and then applied an emollient poultice for several days in succession, frequently changing it. He then dressed the whole eruption with lin. stramonii, washing frequently with Castile soap and water. If the cure was slow, he again returned to the poulticing, and afterwards repeated the dressing. His success, both in hospital and private practice, was proverbial, so that he was consulted far and near for this class of disorders. Hence the simplicity of his remedies is worthy of imitation, especially in view of the obstinacy and difficulty of cure in these affections, potential among generalists.—*Revue.*]

[PTYALISM. Dr. Fahnestock has published a paper in the *Amer. Journ. of Med. and Phys. Science*, vol. v., on the efficacy of the ether phlegm as a remedy for ptyalism. He observes, that the medication is too attended to check inordinate and protracted salivations are all of a highly stimulating, astringent, and often corrosive nature, such as ipecac, emetic, alum, nitric acid, &c., which seldom fail to aggravate the sufferings, and create deep-seated irritation. Having seen very glowing and even fatal effects from salivation, and the remedies employed to control it, his attention was directed to the use of the gentle astringents, such as common tea, &c.; and finding much advantage from these, the experiments were extended to articles still milder, as the elm, cassia, and peach; from the latter of which he has derived peculiar benefit, and continues to use it with uniform and unparalleled success. An infusion of the root bark of the root of the true ginseng is a very mild, mucilaginous refrigerant; moderately astringent, cooling and soothing to the irritated surface of the mouth and throat, and can be applied at any stage, and even to children. It acts by allaying and obliterating excitement, sheathing the delicate surfaces, and healing abrasions.

It is highly interesting, however, to distinguish the several species of this, and particularly the variety, which resembles the plums very closely, and is very poisonous.—(See *Burton's Essay* on the *Medical Medicine of the United States*.—*C.*)

[In the *Amer. Journ. of Med. Sciences* for 1835,

Dr. Young, of Chester, published an account of an epidemic pyalism which he witnessed, similar to that previously described by Dr. Cooper of Philadelphia, in the *N. A. Med. and Surg. Jour.* Dr. Joseph Parisk, of Philadelphia, was the first to direct the attention of the profession to this subject. It occurs most frequently among the poor, and was ascribed by him to confined air, impoverished diet, &c. The symptoms are thus described by him: "A severe sore mouth, closely

surrounding mucronal pyalism, even in the solid breath. The cheeks become thickened and glossy, a sleeping alteration soon follows inside the mouth, excessive discharge of saliva, extensive aphthulation, and occasionally fatal. In many cases no mercury or other medicine had been taken. Dr. Parisk succeeded in curing numerous cases by the liberal use of bark, generous diet, and a solution of the sulphate of zinc with honey, as a local application.—*Russell.*"

R.

[RHINOPLASTIC. In 1837, Dr. John Mason Warren, of Boston, performed the first successful case of the Rhinoplastic operation ever published in America. It had been previously attempted, but failed to satisfy either the patient or the surgeon. In 1840, the same surgeon repeated this operation four times, the first on a female by the Indian method, the flap being taken from the forehead, and he effected in this case the restoration of the entire nose. In the second case he employed the Italian or Tullastonian method, the flap being transplanted from the forearm, and this is the first successful case by this method in America. In the third case he restored the alae of the nose by sliding the flap from the cheek, on the edge delineated by the French surgeons, *"antéplastric par glissement du limbe."*

In the fourth instance he again adopted the Italian method for the restoration of the tip and alae of the nose, the flap being taken from over the biceps muscle. At the end of 72 hours, adhesion was sufficient to allow of the separation of the flap, which is the shortest time on record in which the separation has been successfully accomplished. The only surgeons in Europe who have attempted this operation were the famous Tullastonian, and Delpech of Montpellier, and Graefle of Berlin. It was not until the fourteenth day that Graefle, in his first case, separated the nose from the arm, and it was a year before the case was successful. In his second case, the flap was separated at the end of six days. (See *Lalut de Rhinoplastie.*) In this last case of Dr. Warren, the patient was well in two months, and scarcely a trace of the operation was visible. This case has not been before published, but the others are reported at length in the *Boston Med. and Surg. Jour.*, to which I must refer the reader. Sufficient time has now elapsed to judge of the permanency of the success which has crowned these surgical achievements.

At first it has been observed in Dr. Warren's cases, that the sensations in the new nose were referred by the patient to the place from which the skin was borrowed, to the forehead in those cured by the Indian method, and to the arm in the Tullastonian examples, but this method state

of the sensation is not permanent. The pins were used in his first case but the interrupted suture was afterwards preferred, and is found to be fully adequate of retaining the parts in adaptation, and to prevent less hindrance to the desired adhesion. Dr. Warren has thus proved that this operation is safe, and may succeed; but he has constructed a new nose, which is so natural in appearance that no trace of the operation can be discovered, unless the attention is particularly called to the fact. He has thus restored to society and to usefulness both male and female patients, who were exiles by reason of their hideous deformity of countenance. See *Anteplastic.*

Dr. Geo. McClellan, of Philadelphia, has performed the Rhinoplastic operation four times with complete success. He adopted the Indian method. Dr. Gibson of the same city has also repeated this operation eight times successfully since 1837, the date of his first attempt at Rhinoplasty. He has repeatedly performed Laryngotomy and Biopharyngotomy. Dr. Matter, also of Philadelphia, has reported a case of Rhinoplasty, to which Velpeau awards the merit of originality in his work on operative surgery. See *Ann. Jour. Med. Sci.*, No. 43, for 1838. The same surgeon has since repeated this operation in five cases.

Dr. Massey, of Cincinnati, has performed the Rhinoplastic operation in two cases; once by the Indian method, successful, the other by the Italian mode, failed, in consequence of the restlessness of the patient.—*Russell.*

[RIBS. Dr. J. C. Warren, of Boston, has twice excised portions of the ribs in cases of metastasizing, and in both cases successfully. Dr. Valentine Hunt, of New York, has also performed this operation in a similar case with complete success, and Dr. McClellan, of Philadelphia, has removed portions of the ribs four times. In one of these cases Dr. McClellan removed a tumor, the result of spinal irritation, excising portions of several of the ribs, and projecting into the right side, displacing the diaphragm and lungs, and by its pressure very seriously impeding respiration. This formidable operation was completely successful, the tumor weighing thirteen pounds.—*Russell.*

S.

[SILVER, NITRATE OF. (*Lassar Caustic.*) One of the best of the milder caustics. Its utility in stimulating indolent ulcers, and keeping granulations from rising too much, is well

known to every surgeon. Mr. Hunter considers its application in the early stage of a chancre, while absorption of the syphilitic virus may not yet have taken place. He directs the caustic to

be scraped to a point, like a black-lead pencil; every part of the chancre to be touched with it, and the repetition of this process till the last slough thrown off leaves the steel hard and healthy. The plan has been advocated by many other surgeons, in the hope that it may lessen the chance of the constitution becoming affected; and it is occasionally resorted to by those who use mercury, as well as by collops who trust to other means for the cure of the venereal disease.

The important use of the nitrate of silver in the cure of numerous diseases which fall under the care of surgeons, I have noticed in various articles of this work. The late professor Dieffenbach believed that it had greater power than any other escharotic or stimulant in expediting the process of cicatrization. I entertain the same belief. Its efficacy in the relief and cure of many diseases of the eye, may be learned from the explanations given in the articles *Congestio*, *Tart. Ophthalmica*, &c. As an application to this organ, it is used either in solution, or in the form of a lotion, or of the black ointment, containing from ten to twenty grains of the nitrate to each drachm of lard. Some examples of lupus, or old raw fingers, are benefited by the nitrate of silver, and a strong belief of it agrees well with certain obstinate ulcerations, which occur round the roots of the nails of the fingers and toes. The lotion is sometimes applied by means of a camel-hair brush; sometimes by means of lint; sometimes with a syringe; and occasionally by dropping it on the part, as, for instance, the eye.

In an interesting "Essay on the Use of Nitrate of Silver," vol. 2, Sto. Læticæ, 1829, Mr. Hoggabottom notices its influence in exciting inflammatory action. That it "should excite the inflammation of phlegmon, or of a line of inflamed abscesses, arrest the spreading of erysipelas, prevent and modify the formation of pus," (says he,) are facts, I believe, entirely new. In some cases of external inflammation, he finds it sufficient merely to blacken the cuticle; in others, it is necessary to produce a degree of vesication. In some instances, the application has appeared to prevent suppuration; in others, a plainly purifying fluid has been absorbed.

Mr. Hoggabottom throws out a suggestion, that the application may prove useful also in internal inflammation, by isolating prompt vesication over the inflamed part, or even without it. But, for a particular account of its use in phlegmonous inflammation, whitlow, erysipelas, inflammation of the abscesses, wounds, ulcers, burns, and cases of hard painful cicatrix from the latter injuries, I must refer to this gentleman's publication, in which will also be found observations on its employment, in examples of diseased joints, inflammation of the urethra, neuralgia, contracted oses, ulceration of the tongue, eye, and navel of infants, and canas. In University College Hospital, I often employ it as a means of checking the extension of erysipelas, which sometimes will not pass beyond a black line made with it. Its use in stricture, and many of the cases here specified, is further explained in other parts of this Dictionary.—C.]

[Dr. Joseph Parich, of Philadelphia, introduced a new method of applying nitrate of silver to old ulcers. Instead of touching their edges with the caustic, he applied it to the centre of the ulcer, and found the effect more speedy and successful, the healthy action concentrating in the

centre and radiating rapidly to the circumference. In the Pennsylvania Alms House and Hospital this practice is now pursued.—REAGER.]

[SPINA RIFIDA. Dr. Sherwood, of Ryland, removed this disease by cranium with complete success in 1831, and the next year Dr. A. H. Stevens, of New York, cured an aggravated case by a modification of Sir A. Cooper's method, by puncture.—REAGER.]

[STAMMERING. This defective defect, in which there are many sufferers, is one which, whether dependent on physical causes, or, as it is more frequently, belonging to the morale of the individual, is one for which no adequate or universally applicable remedy has ever been discovered, notwithstanding the devotion shown to the subject by many scientific and phrenologic individuals. Now, indeed, was it ever imagined that surgery could have any thing to do with the subject, unless in those very rare cases in which the defect is dependent upon a contraction or congenital shortening of the *lingua lingue*. Professor Dieffenbach, of Berlin, has, however, within the last year devised and executed an operation designed to relieve this defect, which he is led to believe is wholly physical, and depending on a malformation of the tongue, which he is of opinion can be removed by surgery. The operation is truly a formidable one, consisting as it does of carrying its incision through the tongue, near its root, in one of three ways, viz., 1st. The transverse horizontal division of the base of the tongue. 2d. The submucous transverse division of the tongue, leaving the mucous membrane undivided. 3d. The horizontal division, with excision of a wedge-shaped portion of the tongue. He has repeated these several times until he has decided that the last is the only one at all adequate to the removal of the stammer.

Of the formidable nature of this operation, and of its hazards, Dieffenbach seems to be fully aware, for he says, "It can never be performed by any one who has not the temperament of an operator; the lamp-glass must hold all others at a respectful distance. The extent and importance of the operation, the possible danger to life, or loss of the tongue, through a want of skill in the assistants, who may tear it, when so nearly separated, or from mortification or ulceration of its connecting substance—these are contingencies naturally to be feared, and which must be carefully weighed beforehand."

Dr. Smith, in his late *Account Report on Surgery*, before the College of Physicians of Philadelphia, when commenting on this passage, uses language which will elicit a ready response from every discreet and conscientious surgeon.

"And yet, with these 'rational fears' before him, Professor Dieffenbach hesitates not to recommend the operation, and surgeons of eminence in France and England are rash enough to act upon the suggestion, even at the risk of human life. And this, too, when the results of the operation are doubtful, and before sufficient time has elapsed to pronounce with certainty upon them. No account of the operation of Dieffenbach having been performed in this country has reached us, and we hope, for the honor of American surgery, that no respectable operator will attempt it."

The suggestion implied in this operation of Dieffenbach, and the reports of its success which have reached this country, have led to the hope

that, in these cases of stammering which are dependent upon physical malformation of the tongue, if there be such, some operation may yet be devised for their relief. No reputable surgeon in America would hazard his professional character by "cutting badly down through the tongue to its root, and excising from its centre a wedge-shaped portion of that member," in the faint hope of removing a defect in the speech, due for any other purpose, except it were rendered imperative for otherwise those entering the speedy destruction of life. The well-known insensibility of the tongue, its permanency of structure, by reason of which hemorrhages from this member are an irremediable after-dorming, even in slight wounds, the actual causality together with the hazard of infirmities by reason of the proximity of such a wound to the larynx and other adjacent structures; all these and similar dangers should deter any surgeon from so imprudent an operation as that of Dieffenbach. Nevertheless, physical obstructions to the motions of the tongue, when investigated in any case where the cause of stammering, might possibly be remedied by surgery, without putting the life of the patient to hazard. Indeed, I have known the division of the human ligament, in adult years, remove a most painful impediment in the speech, which uselessly depended upon an abnormal state of that chord, which had not been attended to in childhood. I succeeded thus in a gentleman, who has since become a clergyman, and is a fluent speaker. But my inquiries on this subject fully satisfy me that such examples among stammerers are rare; and that in most cases this infirmity is either the result of habit, or of some peculiar mental state, and is very seldom the result of any mere physical cause. The success of numerous professors of the art of curing stammerers, and which has become, with some of them, a source of fame and emolument, goes to confirm this view of the impediment in such cases, for the most popular of these professors have been known to rely upon a species of moral training, together with modifying the habits of the patient with respect to the manner of giving utterance to vocal sounds, including attention to the petiolities of respiration. Such physiological and metaphysical expositions of the causes of the defect having been intelligibly explained to the stammerer, a very few practical lessons in elocution have removed from his mind the fallacious idea of its being a physical difficulty, and therefore incurable. And so soon as the stammerer acquired confidence in the ability of his teacher to cure the defect, it has been found that improvement immediately becomes manifest, proving that it is the mental state upon which the difficulty mainly depends.

Some surgeons, who have been deceived by stammerers, who have been desirous to submit to the operation, have devised and performed other and minor incisions in the tongue, and in a few instances the results have been temporarily desirable. These operations are for the most part free from danger, and have been repeated in this country by numerous surgeons. Pioneers Mott and Pithoon, at the Clinique of New York University, and Professor Barker, at that of the College of Physicians and Surgeons, have especially divided the genio-hyoglossus muscles, either by the knife or scalpel, cutting closely to the symphysis of the lower jaw,

when there is very little hemorrhage, and no troublesome consequences need be dreaded. The mouth being washed out with cold water, the hemorrhage ceases. In many of these cases the patients, who could neither read nor speak without a painful and laborious impediment, are so much benefited, that the instant after the incision they will read or speak with a fluency scarcely credible, and they will leave the operating room clattering away with freedom, which inspires a confident hope of entire relief. A single hour, however, too often dissipates the delusion, and they find themselves as bad as ever.

In these cases it is obvious that it is the result of an, as the French Physiologists are wont to say, and the operation, which benefits the patient. Dr. Mott became so convinced of this that he contented himself with simply scarifying the mucous membrane of the tongue, and he found the same temporary improvement as in the cases where he divided the muscles of the tongue. Subsequently he performed acupuncturation, as originally proposed and practiced by Dr. Wm. Leane, of this city, by passing two or more needles entirely through the tongue, and withdrawing them after a few minutes, and the improvement in the speech of the patients was rapid and instantaneous; for, like the rest, the impediment returned, and similar results followed the repetition of acupuncturation a second and third time, which was often decried by the patients. Many of these cases I have seen, and these several operations may either of them possibly succeed, if the patients could be prepared to abide in them with absolute constancy, and their confidence remain unshaken afterwards. This may be the secret of Dieffenbach's success, for to induce a patient to submit to his terrible incision, and enter its attendant dangers, very positive assurances of cure must be given; and if a patient should perchance escape the alarming hemorrhage and inflammation, it would be reasonable to conclude that he would never willingly stammer again, if it would subject him to a repetition of the operation. Those instances in which the defect is dependent upon mental or moral causes, might possibly be cured by the powerful impression made upon the nervous system, which we know has broken up other morbid states perpetuated by habit. I cannot learn, however, that in this country any surgical operation upon the tongue has resulted in permanent benefit.

Dr. Alfred C. Post, of New York, was the first surgeon in America who performed the operation for the cure of stammering, by dividing the genio-hyoglossus muscles near their origin. The operation was performed on the 21st May, 1841. Doctor Post has published an account of it in an Appendix to his "Observations on Strabismus."

Dr. Mott, of Philadelphia, has repeatedly tried the various operations for stammering, including myotomy, acupuncturation, and electro-puncture, &c., but without the least benefit, except in those few cases in which there was a positive laceration. In these, myotomy has been useful.

Dr. Parson, of the same city, has met with ten cases of true muscular tongue-tie, and in these the division of the genio-hyoglossus muscle has been useful in relieving the defect, but in all other cases, surgery has failed to afford benefit.

Dr. Deimold, of New York, having observed, in practicing tracheotomy, the immediate though temporary relaxation of the constricted muscles, on the introduction of the knife, was led to substitute incision of the tongue, instead of the division of the genio-hyo-glossal muscles, as practiced for stammering. He informs that the patients relieved for the moment by his method, very soon relapse and are as bad stammerers as ever. But he is nevertheless of opinion that a frequent repetition of this entirely bloodless, though sometimes very painful operation, will eventually be found to effect a complete cure. — *Revue.*

[STAPHYLOPLASTY. Dr. J. C. Warren has performed this operation five times since 1820, the date of his first case, and is as yet unbroken completely successful. He claims to be the inventor of the needle with a movable point, which he employs in these cases.

His son, Dr. John Mason Warren, has operated upon ten cases of fissure, demanding the staphyloplastic operation. In most of them, the fissure existed in both hard and soft palate, extending to the alveolar process, and in one case of a woman thirty years of age, through the jaw and lip. With one exception, all these cases have succeeded to greater or less extent. Where an operation in the hard palate has preceded after the operation, it has been closed by a gold plate.

Dr. Warren's method has been to dissect off the mucous membrane from the hard palate on either side, and stretch this across the fissure, and then unite the edges by sutures. His success has been equalled in such examples, for surgical authorities all deny that union even of the soft palate can be effected, when the fissure of the hard palate exceeds an inch. All Dr. Warren's cases disprove this opinion, and his operation may be regarded as peculiar to himself. (*See Staphyloplasty.*)

Dr. A. H. Stevens, of New York, was the second surgeon in America who performed the operation of staphyloplasty, which he did in 1826, and it will be found mentioned in the *N. A. Med. and Surg. Journal*, by Dr. Hodge, who was present, and witnessed its success.

Dr. Geo. McClellan, of Philadelphia, operated successfully as early as 1825, and has since performed it in two cases of congenital cleft palate, and seven cases of fissures resulting from disease.

Dr. Gibson, of Philadelphia, has been very successful in this operation, and has constructed very ingenious instruments for staphyloplasty, which he has found to possess to afford great facilities to the surgeon, but for the details of his experience I must refer to the last edition of his *Instruments and practice of Surgery*.

Dr. Metcalf, of Virginia, has published an interesting memoir on staphyloplasty in the *American Journal* for 1828, and he therein describes his invention of an instrument for the purpose, which he has frequently used since 1820.

Dr. N. R. Smith, of Baltimore, has performed the operation four times, and is ten instances with entire success; and Dr. Ponsard, of Philadelphia, has operated twice with the like result.

Dr. Sherry, of Cincinnati, has had complete success in three cases, and partial success in a fourth.

Dr. Alexander E. Bruck, of New York, has published a memoir on staphyloplasty, with

cases, and a description of the instruments requisite for the operation. This surgeon has distinguished himself in this department by the number and success of his operations, and his paper on the subject will be found in *some extraordinary merit*. Dr. Hensck, after the operation of Staphyloplasty, directs his patients to swallow mucilaginous drinks and eat soft food, and finds that the parts constricted are not so far from disunited, but, on the contrary, the swelling effect of frequently moistening the wound, greatly moderates the inflammation. He maintains that the natural tendency of the cleft palate is to approximate the edges to the act of deglutition, instead of to put the tension on the stretch, as is generally supposed. Hence this approximation of the edges to the fissure is the act of healing, which was observed by Mr. Ross, and first suggested the idea of uniting them by suture, and the same natural tendency exists after the operation as before, and hence there is less danger of the suture cutting than, unless cut, if incised by frequent deglutition of fluids.

The late Dr. George Babes, of New York, published a work in 1855, upon Cleft Palate, and proposed instruments of his own invention for its cure. He had operated by staphyloplasty with success in a number of cases, and in the case of his youngest child, had attained a high reputation as a surgeon in New York.

Dr. Mott has had great success with this operation in numerous cases, and his assistant, Dr. Carnahan, of New York, has also operated with success.

Dr. Munro, of Philadelphia, has performed staphyloplasty twelve times, and in the *Amer. Journ. of Med. Surg.*, No. 3, new series, he has published a valuable paper on the subject, describing his instrument, and rendering this operation more simple and easy of performance than by the ordinary method. — *Brux.*

[STETHOSCOPE. (*Greek $\sigma\theta\epsilon\sigma$, push, and $\sigma\kappa\omicron\pi\omicron\varsigma$, explore.)* An instrument consisting of a cylinder, originally employed by Laennec, to elucidate the diagnosis of certain diseases of the chest, but now adapted to throw light on the nature of many other cases. (*See Auscultation.*) — A very few words suffice to state (as Dr. Forbes observes) in what way the stethoscope becomes, in the hands of an expert assessor, the means of an accurate diagnosis. By it we learn, that the motions of the lungs and heart, in a state of health, produce certain determinate sounds in certain parts of the chest; and that these sounds are modified in various determinate ways, and certain other determinate sounds superadded in states of disease. By the study of the symptoms during life, by dissection after death, and by considering the principles of the generation of sound, we are able to ascertain, as cause and effect, particular forms of disease with particular sounds; hence, the indications of the stethoscope, in certain diseases, become positive physical signs of these diseases." (*Cyclopaedia of Pract. Med., and Association*) — *C.*

[STRABISMUS. The success of tracheotomy in the removal of club-foot, by Dr. Steiner, in Germany, and Dr. Denoual in America, led both these gentlemen to suggest the practicability of curing strabismus by the section of the constricted muscles upon which it has been long known to depend.

Mr. Anthony White, of London, demonstrated

its practicality by numerous experiments on inferior animals. But the merit of having first operated for strabismus in the human subject is due to Professor Dieffenbach, of Berlin, which he did successfully in October, 1829.

The following year, hundreds of cases flocked to him from almost every part of the continent, and his success seems to have been commensurate with his opportunities; and in both respects he has probably exceeded any other surgeon in the world. His cases varied from children of five years old to adults of forty, and since his earliest publication on the subject, the operation has been repeated in almost every part of the world, and, for the most part, with gratifying results. Exceptions, it is true, have occurred, in which the deformity has not been removed, and in some cases violent inflammation has followed the operation, disfiguring the patient, and even destroying the eye. In most examples of its failure, however, it will be found that there has been either a lack of discrimination in the adaptation of the operation to the particular variety of strabismus, or a criminal ignorance or surcery on the part of the operator. This must be obvious, when we learn that no such results have followed in any single case of Dieffenbach, notwithstanding they already number some thousands, nor indeed have any such lamentable failures been witnessed among the eminent members of the surgical profession in our own and other countries. Such men have been in the habit of repeating this operation more frequently than any other which deserves the name of surgical, seeing that the number of cases is found far to exceed any estimate heretofore entertained; and no disastrous results have followed, so far as I can learn, from extensive correspondence with those who have extensively practised it, even in a single example. That men who are mere operators, not surgeons, and who aspire to the popular cognomen of oculists, such as that which ignorant pretenders as oculists are wont to assume, should be imprudently mislead to the eye by attempting even this simple operation for the cure of strabismus, is probable and even certain. For the acknowledged simplicity of the operation is such, that those pretenders may occasionally succeed in favourable examples of the deformity, while the patient in such cases experiences a happy cure, rather than a cure. But as they are incompetent to discriminate between the essentially different varieties of strabismus, depending as it often does on the contraction of entirely different muscles, and requiring an essentially different operation from the ordinary one in many cases; and as such men are incapable of detecting and appreciating the numerous complications of the deformity so often present, it would be marvellous indeed, if in such hands any operation should often succeed. Because the operation is simple, every singleton in the fraternity has felt as likely to undertake it, unless his failure he has had the temerity to deny the operation, and quote his own experience in order to bring it into disrepute, thus exposing the cause due to his own ignorance.

Professor Gibson's sentiments on this subject, as well as the estimate that distinguished surgeon places upon the operation, are so well expressed in the last edition of his *Institutes of Surgery*, that I here transcribe them. Speaking of the mischiefs which have occasionally followed awkward attempts in this department, he

says: "These deplorable results are to be traced, no doubt, to the pusillitas with which many physicians are affected in performing such operations as are considered easy, or managed with a medium of skill: so that persons totally incompetent, are too often tempted to such enterprises, at what they consider within their reach, and are only consumed by repeated failures, that they have no room for such exploits. The observation applies not to strabismus only, for I well remember, when liberty was first discussed, how eagerly every eye in Europe and this country, and even common instrument-makers out of the profession, jumped at the opportunity of displaying their skill; men who never would have dreamed of performing lithotomy or hernia, and whose modest flights never extended beyond the most insignificant feats of minor surgery." "The time will come, then," adds Professor Gibson, "that candour, when the operation for strabismus will be considered sufficiently delicate and difficult to be worthy the attention of scientific and practical surgeons, and to be trusted to their care, instead of being placed, as it is at this moment, in the hands of untaught surgical traders and quacks, whose imposition on the public are bolstered up by patients and patients, about as ignorant in such matters as the so-called operators themselves."

In the same valuable work will be found a communication from the eminent British surgeon, Sir Charles Bell, whose lamented death has so recently thrown a gloom over his numerous admirers all over the world whose professional merit is estimated. This paper is fully entitled by Dr. Gibson, "An interesting Essay on the Philosophy of Strabismus." It may possibly be regarded as one among the latest professional productions of his noble life, and for its philosophical accuracy and practical importance, it is worthy of being perpetuated by being placed in the Institutes of Surgery. When Mr. Cooper's last edition was issued from the press, no one in England had heard of Dieffenbach's success; nor, indeed, had this great operation for strabismus been then introduced even in Germany. Hence to mention whatever is made of this new illustration of the benefits surgery is conferring upon mankind.

It appears from the Institutes of Surgery, that Professor Gibson attempted the cure of strabismus by dividing the recti muscles of the eye, precisely as now practised some twenty years since in Baltimore. Soon after he repeated it unsuccessfully in Philadelphia in several cases, and was induced to abandon it by the unfavorable opinions expressed on the operation by Dr. Physick. He, however, calculated the propriety of the operation upon the case many years since, and Dr. A. E. Howard, of New York, then one of his pupils, distinctly reflects Dr. Gibson's expressions of confidence, that the operation would ultimately succeed.

In America this operation for strabismus has become very common, and thus far the cases have been for the most part successful. Sufficient time has scarcely elapsed, however, in any of them, to decide positively whether the deformity will be permanently relieved, and whether the fears which have been expressed of the effect upon the ultimate action of the other muscles of the eye, may or may not be well founded. Some few instances have been reported, in which the division of the internal rectus

has produced a tendency to erosion of the globe under the action of the antagonist muscle, long after the immediate effects of the operation have ceased. If these facts should be realized, it would be a sad result; but no evidence has yet appeared in this country which would seem to render it probable. On the contrary, in a great multitude of cases, in which this operation has been performed in America, I have not heard of one in which, thus far, either the surgeon or the patient has had any cause to regret it; unless in such instances of failure as were justly ascribable to the ignorance of the more operators into whose hands the patients were unfortunately enough to fall.

Dr. Willard Parker, of New York, claims to be the first surgeon in America who performed this operation, which he did in August, 1840, and with success. Dr. Delafield, of New York; Dr. Becking, of Arkansas; and Dr. Gross, of Kentucky, soon after repeated it. I regret that I am compelled for want of room, else I should deem it due to Dr. A. C. Post to extract from his work on this subject a portion of the excellent practical remarks with which it abounds. And for the same reason I am prohibited from doing more than to refer the reader to Dr. Gross's valuable paper on Strabismus, published in the *Western Journal of Medicine and Surgery*, for 1842, abridging, so it does, in discriminating criticism upon popular errors on the subject, and furnishing the best statistics on the subject anywhere to be found. Dr. E. H. Dixon, of New York, has also published in the 16th vol. of the *Boston Med. and Surg. Journal*, two papers on the subject, which are numerous and practical. The experience and success of this surgeon entitle his opinions to respect, but I have space only to make this reference. As, however, Dr. John B. Dix, of Boston, has, in addition to extensive experience in this operation, introduced a method of performing it by subconjunctival section of the muscle, I conclude this article by inserting a brief paper from this gentleman, which, in justice to him, I cannot feel at liberty to abridge.

"The operation of dividing the recti muscles for strabismus, as depicted by Dieffenbach, was performed by me for the first time, Sept. 5th, 1840. I have since that time operated on 218 eyes of 116 persons, in 42 cases both eyes being operated on. In 14 the strabismus was divergent, in the remainder convergent.

"With regard to the success of the operation, there is great difficulty in giving a correct statistical reply. In very many cases the position of the eye operated on is not permanently decided for eight months, and the relative position of the two eyes may not be for twelve; while more than two-thirds of the subjects reside out of the city, and are last sight of in a few weeks after the operation."

"If by success is meant an improvement in the position of the eye, a lessening of the squint, every case has been successful. But if by success is meant perfect symmetry in the contour, correctness in the position, and correspondence in the movement of both eyes in every direction, that is, that the eyes shall be in every respect as if they had never existed, success is rare. But, although, according to this rigid standard, it is rarely found, either among my own patients, or those of other operators, which have fallen under my observations, the result is in a very large proportion of cases an successful

find, that to an ordinary observer there is no evidence of a squint, or other defect in the eye. Such, I should say, is the result in three-fourths of the cases; while in the remaining fourth, either the squint is not wholly removed, or the eye acquires a slight inclination in the opposite direction, or else, the position of the eye being good, there is an apparent enlargement of it, rendering it unlike its fellow; or there may be at the inner canthus an unusual gap or depression, owing to the retraction of the conjunctival fold. The difficulty of deriving what shall be considered a perfectly successful result, or, as it is popularly termed, a cure of squinting, has been alluded to, and I have been careful in the above statement of the result of my own operations not to exaggerate their success, but would say, in justice to myself, that if these eyes only had been taken into the account, which have been operated on for the last seven months, the proportion of imperfect results would be much less, in consequence of adopting a mode of operating different from any hitherto proposed.

"If the first step, in the usual method of operating, is to make a midway between the cornea and inner canthus, a long vertical opening is the consequence, by the subsequent retraction of which the conjunctival fold may sink back, causing an abrupt indentation at the inner canthus, and giving to the eye on this side the appearance of a globe lying in the orbit, but detached from it; the eye may project, appearing unnaturally large; or it may incline outward, or too or even all of these conditions may result.

"The subconjunctival division of the muscle, according to the method of M. Guerin, where it is practicable, prevents or materially diminishes these liabilities, and is performed as follows: "The lids being secured, and the patient in a recumbent position, the eye is turned and kept steady by means of a double hook inserted into the sclerina, and an opening is made through the conjunctiva, and the investing sheath of fascia of the muscle at its lower margin. M. Guerin's knife is now to be passed between the sclerotic and the tendon of the muscle, until it is fairly inserted, when the edge is to be turned outward against the tendon, which sometimes parts with a faint noise. This is similar to the operation of tenotomy in other parts of the body, but in its application to the muscles of the eye is often objectionable; though it may be adopted without difficulty, when the insertion is slight, the globe prominent, and the patient an adult of sufficient firmness to hold the eye covered with his little and from the double hook. In order to give to the muscle the degree of tension necessary for the division of its tendon, by simply turning the edge of the knife against it, the double hook must be applied with a force, which, independently of the pain it occasions, might be, though I am not aware that it ever has been, harmful to the internal texture of the globe, while, from the length of the blade and the rolling of the globe upward, which is prevented only in part by the outward traction with the double hook, the usual motion of cutting is impossible to any useful extent. Unless the curvature of the blade very nearly suits the convexity of the globe, where the division is to be made, as the knife is pressed outward, one portion of the blade may be cutting the conjunctiva before the section of the tendon is thoroughly accomplished. And if it be expedient, as it

very decided cases of squint it is, to divide the muscle posteriorly to its tendon, these difficulties are enhanced. But the more numerous cases of decided squint are precisely those in which it is most important to keep the conjunctiva whole, inasmuch as the greater the squint, the greater the liability to projection of the globe and a gap at the inner canthus.

"I have, therefore, adopted the following method, as far more convenient and effective, and less painful. The patient is sitting with the head inclined slightly backward upon the neck, who raises the upper lid, and the eye is everted as far as possible by a voluntary effort. A horizontal slit is made, either with a knife or scissors, just above the upper edge of the muscle, through not only the conjunctiva, but the fibro-cellular investment of the muscle. Through this opening the blunt hook is passed between the muscle and tendon and the sclerotic, and carrying it fully down, the lower margin of the muscle will be certainly indicated by the appearance of the end of the hook, concealed by the conjunctiva, in which, at this point, a second horizontal slit, about a line and a half in length, is made. Through this lower slit the section of the muscle on its tendon is made from below upward, with a pair of slightly curved scissors, one blade passing between the conjunctiva and the muscle, and the other between the muscle and the sclerotic; the muscle being at the same time raised a little from the globe, and effectually prevented from rolling upward by the blunt probe or hook, which has been inserted under it from above downward, and is held in the left hand of the operator while he uses the scissors in the right. The section of the muscle is known to be complete, when there is full evertion of the globe, only a strip of conjunctiva; but it may be still further verified by holding this position of conjunctiva aside, before the hook is withdrawn, so that the sclerotic may be seen or felt. The horizontal openings in the conjunctiva will, at some cases, be found to afford a convenient opportunity of making a free section of indurated and contracted cellular or fibrous tissue, both above and below, a proceeding which, in cases of long-standing, is often required; and from the direction of the slits, their edges are brought more nearly in apposition, the greater change which has taken place in the position of the globe.

"I am fully aware that little credit attaches to those who, following in the track of a great discoverer, strive to appropriate to themselves, by trifling or imaginary improvements, a portion of his reputation, and would by no means be understood to say, that very perfect results have not been obtained in the manner originally directed by Professor Dieffenbach, or that M. Guerin's operation is in all cases impracticable or unsuccessful; but only to express my conviction, that by preserving the integrity of the conjunctiva between the cornea and inner canthus, very important objections to the operation are obviated, and to point out a method by which this may be most easily and thoroughly effected in decided cases. And I am the more convinced that some modification of M. Guerin's method was needed to render it consequently applicable in decided cases, by the fact that I have searched the foreign journals in vain for evidence of the adoption of the subconjunctival operation by those gentlemen who have made the most valuable communications on the subject of Strabismus.

"In one respect only, the subconjunctival has no advantage over the usual methods. Some cases will occur, in which the division of the internal tendon, as far back as possible, is not followed by a sufficient change in the position of the globe, owing either to the joint action of the oblique muscles, or the inner fibres of the superior and inferior recti, or to the influence of the union vaginally with the recti. The division of more than one muscle is seldom, perhaps never expedient, as shown as by repeating at intervals of four or six weeks the division of the same muscle, or rather separating its recent adhesions, a straight position will be gradually attained with less projection of the globe.

"When the squint affects both eyes, the two should never be operated on at the same time, and a much longer interval should elapse than is recommended by writers on this subject. Too great haste may result in the eversion of one or both, a result which can be averted only by dividing the opposite muscle at the expense of an increased projection. I now wait six and twelve months before touching the second eye, which, meanwhile, frequently becomes sufficiently straight, and accordingly the proportion of cases in which both are operated on is much less than formerly.

"The above remarks apply to convergent Strabismus.

"In divergent Strabismus the operation may be considered to be almost invariably and completely successful. I have seen in but one case any sensible projection of the eye. It is, therefore, in this form of strabismus, not important to perform the subconjunctival operation in view of the ultimate result, though by preserving the integrity of the conjunctiva the subsequent inflammation, slight under any circumstances, is still less, and no inconvenience is felt from the temporary lacerous growth, which often arises from an extensive vertical section of it."

The following analysis of 50 cases of strabismus has been prepared by Dr. Dix, of Boston, and may serve as indicating the value of the numerical method. It is extracted from his treatise on the subject.

Analysis of 50 cases.

Females	31
Males	19—50
Convergent	48
Divergent	2—50
One eye only squinted and was operated on in	35
Double, that is, requiring the operation on both eyes	14—50

Three cases are supposed to have been congenital, and the squint was observed previous to the eighth year in every case except two.

The causes assigned were as follows, viz.: Fits six, inflammation five, Hooping cough five, Chorea one, Blow ten, Fracture of skull one, Intussusception eleven, Unknown aetiology—Recess.

[STRICTURES IN THE URETHRA. Dr. Alfred C. Post, of New York, has published in the New York Journal for 1880, a series of Hospital Reports on this subject which is of great practical value, but my limits will not allow more than this reference to his paper. In one extremely aggravated case, complicated with fistula in perineo, this gentleman adopted the treat-

ment by ligation, though in most cases he has succeeded by gradual distention.

Professor Dugas, of Georgia, has a paper on the subject of treating strictures by excision in the *Southern Med. and Surg. Jour.*, vol. i, p. 211.

Dr. Allan Goldsmith, of New York, is devoting a large share of attention to the treatment of strictures of the urethra, and has had great success in the employment of iron bougies of a conical shape, upon which he chiefly relies.

Dr. Palmer, of New York, reports in the *New York Gazette*, vol. i, No. 2, 1841, a case illustrating the dangers of employing bougies made of elm bark, which material has been recommended in some of the journals. In this case he was obliged to perform the lateral operation of lithotomy, for the removal of a ball composed of elm bark left in the bladder by the employment of bougies and catheters made of this substance. One such case occurring in a century ought to banish such bougies from practice.—*Review.*

[STRYCHNIA. Its calls, and the extract of nut vomica, have been found useful in paraplegia, anasarca, some forms of deafness, and a few other paralytic affections, from disease or external injury. The anesthetic use of strychnia is noticed in the article ANAESTHETICS. "Strychnia in all its forms, pure or combined," says Mr. A. T. Thomson, "is a powerful excitant, displaying its influence, first by an increasing energy of the whole system; and next chiefly on those tracts of the medulla spinalis, which give origin to the motor nerves. The nerves of sensation, however, are also involved in this action; for, along with the muscular contractions and convulsions which supervene, the surface of the body is so morbidly sensitive, as to be sensible of the slightest hyperæsthesia; even the motion of the air becomes a source of uneasiness, nearly as considerable as in hydrophobic cases." (See *Edin. of Nat. Hist. Med.*, &c., p. 186, edit. 2.)—C.]

[STUMPS. P. G. Van Boome, in 1803, published a valuable work giving an account of the changes which occur in the texture of stumps after amputation, and particularly in the bone. *De la, par in partibus nuda periculis, acutis emulacione, adheſione, necesse sunt* (Lugd. Bat. 1803, 8vo.) In the 18th vol. of the *Med. Côt. Trans.*, Mr. Langstaff has published many interesting remarks on the healthy and morbid condition of stumps. According to his investigations, after the division and organization of lymph in the healing process, "the absorbents remove such superfluous parts of the muscles, as are likely to retard the progress of cicatrization of the integuments. After this period, the nutrient arteries of the potential covering of the divided bone or bones, and the medullary parts, deposit lymph; a medium of cellular tissue is produced, which unites to the organized integumental surface, and these together form a capsule, as a protection to the end of the stump." The absorbents remove the superfluous ossification by the division of the bone; a deposit of coarsen matter takes place round its edges, forming a junction with the new bony substance thrown out by the vessels of the medullary texture; and the absorbents, if not interrupted by a diseased state of the stump, produce a regular rounded appearance of the extremity of the bone, in which merely superfluous are left for the cicatrization of the nutrient arteries, veins, and nerves of the shaft of the bone, with its covering.

"Should the surface of the amputated part not regularly unite by the first intention, or by

the second, and there be inflammation affecting the divided nerves, then a morbid action is established, which occasions the fibres of the stump to ulcerate or mortify; frequently causing a protrusion of the extremity of the bone to process, which occasionally becomes carious, and should be taken off." In other instances, osseous deposits take place under the edges of the skin, in various degrees amounting to exostosis; and sometimes a spiculum of bone projects from the stump, generally taking the direction of the artery, vein, and nerves of the limb, which thus become implicated with the bony deposits; and sometimes (says Mr. Langstaff) "I have found a large spiculum of bone, with a very sharp point, taking an oblique direction, and connected with a muscle, occasioning morbid changes in its fibres, and being a source of great suffering to the patient. In all such stumps, I have invariably found the nerves greatly enlarged at their extremities, giving them a glistening appearance, and generally firmly adherent to the surface of the stump, and frequently as risen with spicula of bone." On cutting through these bony extremities of the nerves, Mr. Langstaff did not notice any marks of enlargement of their natural structure, the thickening appearing to have been occasioned wholly by the deposition of lymph, the effect of inflammation in the cellular tissue covering the tendons. Mr. Langstaff gives the particulars of numerous preparations and cases in confirmation of his statements. In amputations, he prefers the flap operation to the circular, cutting obliquely through the integuments, muscles, vessels, and nerves, and taking especial care to preserve a sufficient quantity of skin to cover the end of the bone. He notices the bad consequences of leaving too much muscle in the circular operation, in impeding the adhesive process. "If," says he, "in performing the flap operation, a sufficient quantity of skin is not preserved to cover the stump, and the ends of the nerves are likely to be included, while cicatrization is going on, I should have to lament its shortening them by cutting off a portion of each."

The frequent necessity, however, for cutting the large nerves twice, is considered by many surgeons—as which number I wish to be included—as one of the principal objections to flap amputations, more especially of the arm. Thus Sir Charles Bell observes, "Of all the conditions to which man is subject, there is no state of suffering more severe than that produced by the engagement of a nerve in a stump; and therefore I say, that it is most important that the nerve should be directly divided across, and not obliquely torn out. You cannot seem the effect unless you make a free and decided division of the muscles. When you pierce the limb with a great cutting knife, and put it close as the bone, and draw it out obliquely, to make the flap, you cut the nerve longer than the other parts. The nerve is firm, but very elastic; it is not so easily cut through as muscles. Hence change, it goes before the edge of the knife; and, if you look carefully to an amputation performed in this way, you will find that the nerve hangs out, that it becomes necessary to draw it out, and cut it again. What do you say to cutting the nerve a second time, by way of proof that this operation is attended with less pain?" (See *Leed. Med. Gaz.*, vol. xv, p. 35.) In post mortem examinations, Mollin and Morgagni long ago found the ends of nerves, which had been cut through, enlarged. Lower and An-

remain noticed the same occurrence in animals, and Prochaska gave an instructive description of such a case.

In Van Hoesen's work are excellent representations of this condition of the nerves, as well as of the enormous deposition at the end of the bones of stumps, and of nerves in various degrees and stages. In Forrier's *Clin.-Kupferstich*, pl. 113, the same things are represented, accompanied by an account of two preparations of stumps, preserved in the museum of the University of Bonn by Professor Mayer, the particulars of which merit the attention of all who are investigating the present subject. Cuvillier has published a representation of a shoulder-stump, after an amputation performed many years previously by Larrey. The changes in the muscles and ends of the vessels are carefully drawn and explained, as well as the ganglionic enlargement of the nerves. (*Anat. Pathol.*, t. i. livr. vi. p. 3.—Paris, 1829, 3s. fol.)

In University College Museum is preserved a stump, which, in consequence of bleeding, had been opened on the first night succeeding amputation. Looked over some days; the bone protruded to the extent of an inch; and in six weeks the case ended fatally. The extremity of the sciatic nerve is seen enlarged; and conformed to the cicatrix.

When the severe neurogic affection of a stump, sometimes attended with convulsive twitches, is dependent upon the badness enlargement of the end of a nerve, it may sometimes be cured by the repetition of amputation, or even by the mere excision of the extremity of the nerve. The latter operation, I think, with Mr. Mayo, is to be preferred, if the symptoms are clearly attributable to an affection of one nerve. (*Revue Pathologique*, p. 139.) In support of this advice, Mr. Mayo gives an interesting example of the success of the practice. He likewise adds the particulars of a case, in which the source of the painful affection of the stump was not confined to the cut extremity of the nerve. A second amputation had been performed. "On examining the amputated part, the sciatic nerve and the saphenous nerve were found to terminate in large callous bulbs. In the second operation, care was taken to draw out and remove a considerable portion of the sciatic nerve, which, extracting, lay well covered among the muscles. Nevertheless, when the stump had nearly healed, the old pain again commenced," but was more circumscribed. Mr. Mayo now cut down to the sciatic nerve, where covered by the lower flaps of the gluteus maximus, and divided it. "A portion of it was then removed. The benefit was only temporary. Mr. Mayo suspects that amputation at the hip might cure this patient, though both to recommend this formidable proceeding; and refers to a case in which a neuralgia, which had followed an amputation above the wrist, had returned after a second amputation, but been permanently cured by amputation of the shoulder. Sometimes the relief afforded by excision of the bulb of the nerve is not complete, as we find exemplified in the case under Mr. Palmer, who removed from a stump a portion of the brachial nerve. "The stump is still occasionally agitated by slight spasms, and the nerve, for above two inches above the cicatrix, (as may be perceived by feeling through the integuments,) is still enlarged and very sensitive. Unquestionably the relief afforded has been immense; but I now regret that I did not in the first place remove a

greater length of the nerve, so as completely to exclude the possibility of its being again involved in the new cicatrix." (Palmer, in *Lond. Med. Gaz.*, vol. xvi. p. 230.)

When the soft parts are deficient, and the bone protruded on the face of the stump, various attempts are often made to bring the integuments together by adhesive straps. These misadventures (as Mr. James correctly observes) commonly fail, but are indeed mischievous; for, if the straps are brought over the surface of the bone, then they bind down this thin and brittle covering upon a broad surface, which is sure to dislodge them to some; and, if applied at the sides, although they may bring the edges together, yet they will force the soft parts still more back than the bone. The only remedy for such stumps, according to Mr. James, is to be found in the skilful application of a truss, and a proper position; and these failing, in sawing off the bone higher up. (See *Practical Med.* and *Surgical Trans.*, vol. iii. p. 228.)

Mr. Benjamin Phillips has written some good remarks on inflammation of the medullary membrane succeeding to amputation; one of the most serious, and, as it appears to this gentleman, not the least frequent of the accidents which follow its operation. He from this case that proceeds to the whole thickness of the osseous bone mostly arises. The several stages of the case are well described by Mr. Phillips, as that of simple congestion of the medullary membrane; another, leading to osseous deposits; a third, attended with the formation of pus; and a fourth, with gangrene of the texture in question. Mr. Phillips ascribes the disorder to the violence inflicted upon it by the saw. An anxiety, he observes, is felt to prevent such action of the saw upon the periosteum; "but the action of the instrument upon this membrane would not bring about these formidable consequences, with which such injuries to the medullary membrane are pregnant." He notices the custom, followed in many parts of the continent, of applying a very tight bandage round the stump, for the purpose of preventing the retraction of the muscles. "This system," he states, exists at La Charité in Paris, where the promotion of premature terminations in cases of amputation is very great. Dr. Carswell thinks it probable that this tight bandage does not produce congestion, and a tendency to inflammation of the medullary texture of the osseous bones. (B. Phillips, in *Lond. Med. Gaz.*, vol. xii. p. 188, &c.)

When the end of the femur, tibia, or other bone of a stump, is affected with caries of its whole thickness, and this for some extent, the excision and removal of the sequestrum is the most expeditious means of cure. (C.)

[SUTURES.] For the few operations in which the twisted suture is still retained in practice, the common pin, preserved by Vespasian to that made of steel, silver, or gold, has been generally introduced into this country. This objection to steel, that it soon oxidizes, is not remedied by glazing them, as experience proves. When silver or gold is used, they become too thick when the steel points are applied, and they are not firm enough to act without them. Dr. Eve, who has employed the common pin, informs me that he has known it to remain ten days beneath a varicose vein, and yet continue as bright as ever. Vespasian prefers the common pin in all cases of operations upon the veins, where it is so important to avoid inflammation.

Dr. E. H. Dixon, of New York, has devised a novel form of needles for passing the interrupted suture in deep seated wounds, and adapted also to staphylocraphy. I regret that

my limited space will permit me only to refer to the 25th vol. of the Boston Med. and Surg. Journal for a description of the invention.—*Amnat.*

T.

[TENOTOMY. The name given to the division of tendons for the removal of deformities dependant upon a loss of equilibrium in the antagonism of corresponding muscles, as recently practised by Stromeyer and Dieffenbach, in Germany, and within a few years adopted throughout the surgical world. The divisions which have been divided by surgeons within a few years past for very neck, strabismus, club-foot, and other deformities are very numerous, and I must content myself with a brief catalogue of the muscles whose tendons have been subjected to division in America, referring to the several articles in this Appendix for further and detailed information. The sternocleidomastoides; tendo Achillis; fibula anticus and posterior; peroneus; flexor digitorum profundus; the extensors of the toes; the flexors of the toes; the continuations; the semitendinosus; the gracilis; the sartorius; the adductor longus; the tensor vaginae femoris; the fascia lata; the gluteal fascia; the masseter; the biceps brachii; flexor carpi radialis; flexor carpi ulnaris; palmaris longus; flexor digitorum manus sublimis; flexors of the fingers; pretorius; biceps brachii; gemelli digitorum; rotator internus and externus oculi; superior and inferior rectus; superior and inferior oblique, besides a great variety of the flexor and extensors of the limbs. All these tendons have been divided subcutaneously, a measure which is found not only to make the operation almost bloodless, but which, at the same time, avoids subsequent inflammation, and greatly facilitates recovery. (See WILKINSON, and other examples of orthopedic surgery.)—*Hæzer.*]

[TESTICLE, DISEASES OF THE. Sir Ashley Cooper believes, that the body of the testicle is less prone to disease than the rest of the human body, but acknowledges, that it is often the seat of disease, and that the spermatic cord, and the coats of the testicle, are subject to a great variety of diseases. Among the circumstances which appear to him to offer some explanation of the frequency of diseases of the testicle, are the following: 1. Their position, situation, which renders them very liable to inflammation. 2. For the blood granules, testis, and returns with difficulty by the veins. 3. The exposure to which they are liable from passion, and which, when an admixture of being immediately grafted, leads to an accumulation of sexual secretion, and to a painful and excessive distension of the spermatic tubes, followed by inflammation. 4. The testicles are greatly exposed to blows and pressure. 5. They are frequently involved, secondarily, in consequences of diseases of the urethra and prostatic gland. 6. The changes which the testicle undergoes in old age and at puberty, sometimes being of disease. 7. 8. The liability of the testicle to be prevented, or interrupted, in its descent into the scrotum. This movement, though usually completed before birth, is often delayed for years, and the testicle may thus remain at the lower

part of the abdomen, or in the groin; in which last situation it is much exposed to injury. (See Sir A. Cooper, On the Structure and Diseases of the Testis, part 2, p. 5.)

The diseases in which this organ is concerned, conveniently admit of being referred to four heads: diseases of the testis; of the tunica vaginalis; of the cord; and of the scrotum. The reader will find an account of the three last classes of diseases in the articles HYDROCELE, FLUORESCENCE, SCROTUM, and VASICULITIS, so that these subjects will not require particular notice in this place.

It would perhaps be difficult to cite any department of surgery in which greater improvements have been made, within the last twenty years, than in that which relates to the dissection and more judicious practice adopted with regard to diseases of the testicle. The testis is, that operation, which at one period used to be performed every week, and sometimes two or three times a week in the hospitals of London, is now a comparatively rare proceeding. The same beneficial reform appears, from the testimony of Dupuytren, to have been also made in France, where, he observes, that the love of operating, without any kind of true occasion for the measure, was formerly more conspicuous only exemplified than in cases of enlarged testicles. But, says he, at the present day, about a hundred patients are annually admitted into the Hospital for such diseases, most of whom are cured, and stand in no need of being operated upon. In the majority of instances, Dupuytren ascertained, that the enlargement of the testicles proceeds from external violence, syphilis of long standing, or from scrophulous or some other unfavourable state of the general health; and hence he regards it a rule never to resort to castration, without having first tried, for a full month or six weeks, some method of treatment adapted to the cause of the complaint. (See Dupuytren, in Clin. Chir., t. i. p. 85-88.)

Acute Inflammation of the Testis: Orchitis, (from *orchis*, a testicle,) or *hemorrhoiditis*, as abroad has commonly name for the complaint, more especially when it arises from irritation in the urethra, another excited by gonorrhoea, injections, bougies, or stricture. This last expression being founded, as Sir Ashley Cooper justly observes, upon mistaken pathological principles, it ought to be rejected. When acute inflammation of the testicle shows even sympathy with the urethra, the first symptom is an irritation in the membranous or prostatic portion of that canal, succeeded by tenderness in the spermatic cord, and swelling and pain in the epididymis. The swelling perhaps is generally first noticed in the latter part, the testicle next swells, soon increasing in two or three times its natural size, and becoming so tender that the pressure of the thigh on it can scarcely be endured. Its weight being also increased, it draws the spermatic cord painfully downwards; and, in this state, the patient complains of

held by supporting the part with his hands. The pain is obscure, resembling the suffering caused by squeezing the testicle. The pain and swelling extend along the spermatic cord into the inguinal canal, and great tenderness is experienced in the groin, hip, inner part of the thigh, and especially the knee, in consequence of the origin of the spermatic nerves from the lumbar. "From the communication between the renal and spermatic nerves, with the nerves of the stomach by the solar plexus, and with those of the intestines through the mesenteric plexus, the stomach is affected with nausea, and sometimes escape vomiting," and pain in the intestines and moderate constipation are usually experienced. (See *Astley Cooper, Op. cit.*, part 2, p. 8.)

Although the testicle is sacculated in its capsule, that the edge of the scrotum, or rather, it still retains its originally oval form, being rounded at its fore-part, but somewhat flattened at its sides; and it feels exceedingly hard. The scrotum, the ridge of which are obliterated by the distension, presents a smooth appearance, and is rather thin; natural; and, as scum is effused in its cellular tissue, it often pits or pines. Its veins are quite large and prominent, and, if punctured, bleed very freely. With reference to its original dimensions, the epididymis always feels more than the testicle itself; which Sir Astley Cooper ascribes to the covering of the former part being less compact. The epididymis remains also longer swollen than the testicle, the glands major and minor being more enlarged than its body, and the swelling of the first generally very perceptible in front of the spermatic cord. The pressure made by the tendon of the external oblique on the swollen cord is the occasion of severe pain, which sometimes undergoes severe exacerbations from spasm of the cruminal.

During the violence of the inflammation, the constitution is often greatly disturbed; the tongue becoming furred, the pulse quick and hard, the skin hot, the bowels confined, and blood taken from the arm, presenting a buffy and coagulated appearance. It is an observation, made by Sir Astley Cooper, that when acute inflammation of the testicle arises from sympathy with the urethra, it rarely proceeds to suppuration, but when it is the effect of a blow, or of vicissitudes of temperature, suppuration sometimes, though not frequently, follows; and then all the symptoms are aggravated, and suppuration added to those already described. In fact, the purulent matter being confined by the fibrous covering of the albuginea, a texture that adheres with difficulty, much time elapses before the abscess bursts; and when this happens, several openings and sinuses are frequently formed, which discharge both pus and seminal fluid, and are difficult to heal. (See *Astley Cooper, Op. cit.*, p. 10—12.)

A case attended a soldier, with acute inflammation of the testicle, in the Military Hospital of Cuscutary, who experienced so much pain in the abdomen on the fifth day of the attack, accompanied by vast swelling of the cord, almost incessant vomiting, complete and obstinate stoppage of the stool, and severe constitutional disturbance, that a suspicion of hernia was raised. The absence of tension in the abdomen, the limitation of the pain to one side of the belly, the inability of finding anything like the testicle of its ordinary size below the tumor, so in a horizontal, and the history, which made it im-

possible that the case could be a congenital hernia, were circumstances, which prevented an erroneous view of the complaint from being adopted. "But, (as Sir Astley Cooper observes,) if a hernia had existed on the side by which a blow has been received, and the patient has a swelling attended with exquisite pain, sickness, and vomiting, redness of the scrotum; or even a purple appearance of it, suppuration, of two or three days continuance, with tenderness of the abdomen, then great caution will be required in forming a judgment of its nature, and in determining on its treatment. It will be best to give a purgative injection immediately, as well as an aperient medicine; and free evacuation from the intestines will determine the question. The swelling will be harder than hernia, its form different, and there will be a greater pain in the part." (*Op. cit.*, p. 13.)

With respect to the causes of acute inflammation of the testicle, the greater number of examples of it unquestionably arise from irritation in the urethra, especially its prostatic and membranous portions. In the early stage of gonorrhoea, inflammation of the testis rarely occurs, but between the tenth and twenty-sixth days, it frequently takes place. "Sir Astley Cooper's investigations lead him to believe, that it happens in consequence of the vegetation, and irritation of the seminal ducts, by contagion; and the inflammation extending along the interior of the cat deferent to the testicle." (*Op. cit.*, p. 13.) When inflammation of the testicle comes on in gonorrhoea, the urethral discharge generally stops, or undergoes a considerable diminution, so that it appears to some pathologists as if there were a transference of the inflammation from the urethra to the testicle; a view to which Sir Benjamin Brodie inclines, and which is entirely different from the other, to which I have been alluding. He states, however, that "inflammation of the testicle seems to be sometimes independent of the transference of the inflammation, or of the suppression of the discharge from the urethra; and it must then be attributed to the extension of the inflammation of the urethra, and not determined to the testicle." (See *Lancet, Med. Gaz.*, vol. xii, p. 218.)

By many surgeons, the employment of injections for the cure of gonorrhoea, is regarded as a frequent cause of inflammation of the testicle. If they be used, Sir Astley Cooper is of opinion that the patient should be directed to compress the urethra two inches from its orifice, so as to prevent the fluid from passing beyond that point, and towards the membranous and prostatic portions only.

It is well known to every soldier of experience, that the irritation of the urethra with bougies, or catheters, often brings on inflammation of the testicle; but, according to Sir Astley Cooper's observations, this rarely happens, except when the instrument is pushed beyond three or four inches. Any injury (the size) of the prostatic gland may have the same effect, as a sometimes noticed after lithotomy. "The prostate gland, which seems almost in a constant state of ager, is sometimes accompanied with inflammation of the testis. Inflammation on the neck of the bladder produces this disease; and a calculus in the bladder, pressing upon the neck of the urethra, has been known to occasion it, although it generally produces only a spasm of the urethra muscle. A blow upon the testis is a frequent cause; and, if it be severe, it

produces swelling at the instant." (Sir A. Cooper, *Op. cit.*, p. 18.)

The same distinguished surgeon has remarked, that "a wound of the testis does not produce the pain and inflammatory effects which might be anticipated; for (says he) I have several times known a thick, and even a broad, thrust into its substance. It is followed by a screaming pain, and the patient sometimes vomits; but the wound heals readily, and without suppuration. In one case, however, in which the thorax was twice thrust into a testis, violent inflammation and suppuration succeeded." (*Op. cit.*, p. 19.) The scrotum, not yet descended into the scrotum, they induce from the pressure of a thrust; and give rise to excessive pain, counting, constipation, tenderness in the abdomen, and severe urinate disturbance.

Acute inflammation of the testicle often produces a considerable effusion of serum fluid in the cavity of the tunica vaginalis; but, as the substance of the inflammation, this kind of hydrocele is absorbed. Another effect, noticed by Sir Astley Cooper, is adhesion and thickening of the above membrane, which effects coagulation and in a great while, and may be mistaken for a disorgan of the testis itself. The adhesion of one portion of the tunica vaginalis to the other may be either partial or complete. The epididymis also yields, sometimes at its lower, and sometimes at its upper part. When such swelling is at the lower, it is believed by Sir Astley Cooper to be situated in the cellular tissue of the vas deferens, where it forms its first convolutions; and frequently it does not depend upon any effusion in the interior of the duct, and consequently the fluctuation of the testis continues perfect. When the swelling occupies the upper part of the epididymis, or its globus major, adhesive matter is effused into the cellular tissue, "between the rete vasculum, at their termination in the epididymis, and sometimes a jar, containing a sanguinolent fluid, is found in this part. This portion of the epididymis is more frequently diseased than any other part of it, or the testis; but the result is less important than in other parts, because some of the vasa effluents and venous blood will carry the serum from the testis to the epididymis. The coat vasculosa, after this stage of disease, are thickened, hardened, and of a dark brown color." Sir Astley Cooper possesses also a preparation, in which, after inflammation, a nodule, somewhat larger than a pea, was seated amidst the seminiferous tubes, surrounded by an exceedingly vascular surface. In general (says he) I observe, that where there are marks of inflammation upon the tubes of the testis, such as thickening, the substance of the gland itself is changed, the septa are much more apparent than usual, the number of the seminiferous tubes is diminished, and their size so reduced, that many are converted from tubes into mere cords. (Sir Astley Cooper, *Op. cit.*, p. 21.)

The actual condition after inflammation of the testicle, is described by Sir Benjamin Brodie as depending upon effusion of lymph into the interstices of the tubular structure, and as not producing any permanent injury of the function of the organ. In six or twelve months, the hardness disappears; "but," he adds, "there are a few cases, in which the inflammation is so severe, as actually to injure some portion of the glandular structure. I examined the body of a gentleman, who had had inflammation of the testicle

from a gonorrhoea twenty years before. The testicle, which had been inflamed, was then three times smaller than the other, and a part of it remained considerably indurated. I knew these facts previously, and I was curious to examine the state of the testicle by dissection. On taking a section of it, I found that about two thirds of the tubular testis remained in their natural condition, while the remainder had become converted into a white substance, having the appearance, but not the fibrous structure, of ligament." (*See Lond. Med. Gaz.*, vol. xlii, p. 218.)

Atrophy, or a wasting away of the testicle, which is an occasional consequence of inflammation of it, is observed by Sir Astley Cooper to take place more frequently at puberty than any other age. A person receives a blow on the part, or the testicle inflames spontaneously, or, more rarely, the atrophy follows some hæmorrhage from gonorrhoea. The change consists in an absorption of the whole of the glandular structure, the tunica vaginalis being left adherent to the tunica albuginea, with the septa within the latter. In a wasted testicle at St. Thomas's Hospital, quickly dissected in the vas deferens only about half way between the abdominal ring and the epididymis. (Sir Astley Cooper, *Op. cit.*, p. 21.) A patient with acute inflammation of the testicle should wear a suspensory, and keep himself quiet on a sofa, or even in bed, in the recumbent position. Leeches should be applied to the scrotum, and, if the local and general symptoms be severe, it may be necessary to take blood from the arm, or even the legs by cupping. When leeches cannot be obtained, the surgeon may penetrate three or four veins of the scrotum, with the point of the lancet introduced transversely with respect to these vessels, which will then bleed freely, more especially if the parts be placed in warm water.

The recumbent position does not obviate the necessity for supporting the testicle with a suspensory bandage, or bandage, and, as Sir Astley Cooper remarks, the inflamed part should thus be brought towards the abdomen, and not suffered to fall between the thighs, which would destroy the salutary influence of the recumbent posture. The suspensory bandage should have four tapes: two in front and two behind. The two anterior are carried to the hips, which they cross, and are tied on the femur of the abdomen; whilst the two behind ought to be brought up to the perineum of the groin upon each side, and should be fastened to those which crossed the abdomen. Thus a good support is given; but if the hinder tapes are carried between the thighs to the hips, as they usually are, the testicles are partially drawn back, rather than supported." (Sir Astley Cooper, *Op. cit.*, p. 25.) When the patient has not a regular suspensory bandage, he may support the part very well with a handkerchief, which may be fastened at each end to another handkerchief, or hand, placed round the loins, or a bandage, which may be "fastened in a triangular form, and a piece of tape attached to the middle of its base, and carried between the thighs to the back, where two of the ends of the handkerchief are to be tied, while the third angle is brought forward and upwards before the scrotum." (*Op. cit.*, p. 26.)

With respect to local applications, cold ones frequently answer best, when the pain is not very severe; but, in other instances, sanguifuges and poultices are generally preferable.

When leeches are used, it is an excellent plan, after they drop off, to apply a plaster, into which the leech will not continue to bleed for some time very freely, without any occasion for the surgeon or patient to take further trouble to promote the hemorrhage. Warm emollient applications are supposed to act beneficially by their relaxing effect on the textures covering the swollen testicle.

In addition to the foregoing means, the bowels should be kept open with antimonial saline purgatives; and, during the prevalence of severe pain, or great nervous irritation, eight or ten grains of the compound powder of ipecacuanha, or half a grain of the tincture to acetate of morphia, should be given every evening.

The liquor plumbi subacetatis diffusi, with or without a small quantity of spirit of wine added to it; or the liquor ammon. acet., if no leech-bites are present; or a solution of one drachm of the mixture of ammonia in a pint of water, are all of them applications in common use, when cold cases are judged advantageous. Unless the inflammation yield quickly, the local bleeding must be repeated, and even in some cases resection. Early and increasing doses of tartaric emulsion are exceedingly resorted to. Mr. Hunter states, that he has known a scrotum remove the swelling almost instantaneously. "The effects of the vomit most probably arise from the sympathy between the stomach and the testicle." (*On the Venereal Disease*, p. 91.) Sir Astley Cooper notices certain irritable constitutions, in which the continuation of depletion will not succeed; here, says he, "the last practice, when the pulse is jerking, the patient irritable, and the part painful, is to give the subcutaneous of mercury with pulvis ipecacuanha comp."

If suppuration occur, incisions and punctures are to be applied; and, as soon as the matter can be perceived, it should be discharged, so otherwise the scrotal substance of the testicle is destroyed, and several openings, instead of one, are produced. (*Sir Astley Cooper, Op. cit.*, p. 91.)

It is generally a long time before the swelling of the testicle entirely subsides; previously to its becoming less, it usually becomes softer. "It is said much longer, (as Mr. Hunter observes,) sometimes even years, before the epididymis returns to its natural state; sometimes it is never reduced to its natural size and softness; however, this is not of much consequence, as so great inconvenience results from the continuance of the hardness simply, though sometimes, perhaps, such testicles are rendered totally useless. I never had an opportunity of examining the testicle of one that was known to have this complaint; but have examined testicles where the epididymis was but the same external feel, and where the gland of the vas deferens has been obliterated. But this I suspect seldom happens; for there are people who have both testicles swollen, and, notwithstanding, discharge their semen as before. It is in this stage of the complaint, that residents may be of service, such as mercurial friction joined with saunders." (*Hunter on the Ven. Disease*, p. 92.) Ointments, containing the hydrate of potash, are also now sometimes employed with the view of dissolving the induration; as likewise are poultices composed of vinegar and oilseed; the emulsion codon. cum hyalargene; or a lotion, consisting of granule of ammonia and rose

gar, mixed with bread. A suspensory bandage, lined with oilskin, is recommended by Sir Astley Cooper as an excellent application. Recommendations with local-mercury constitutional treatment, as small doses of the bicarbonate of mercury, or pul. hydrarg. gr. ij, acet. tart. gr. i, or extract elæagnth. comp. gr. ij, with ipecacuan. gr. ij, made into a pill, and taken every night. It must be stated, this is deemed advantageous. He speaks also generally of the effects of the liquor potassæ, the pul. hydrarg. chloridi comp., and the tincture of iodine, its effects being carefully watched.

In cystic or parietal, there is occasionally a transfer of the inflammation to the testicle; a case requiring the exhibition of liq. ammon. acet., with sulphate of magnesia, or the saline mixture with tartarized antimony, and a pill, containing opium and antimonial powder. Leeches, with a poultice, or cold lotion, are also proper. (*Sir Astley Cooper, Op. cit.*, p. 93.)

The granular swelling of the testicle, as it is termed, is a protrusion of granulations from an abscess either of the epididymis or testis, and may be the result of acute or chronic inflammation. The granulations, as they arise, being compressed by the surrounding nature of the tunica albuginea, protrude through the ulcerated opening in it, and form a swelling, which often projects through the scrotum. This disease has received the names of *fungus* and *fungus testis*, but very improperly, as it consists neither of a fleshy substance, nor of a real fungus. Sir Benjamin Rindley gives the following account of it, as an occasional consequence of chronic inflammation of the testicle: "The testicle becomes adherent to the skin at one part, and here the skin inflames and ulcerates; and then a fungus, of small size at first, protrudes through the ulcerated opening, but gradually becomes larger afterwards; and, on the surface of this fungus, you find some of the same kind of yellow substance which is within the testicle itself. What is called a fungus, however, is not a fungus in reality, but the granular structure of the testis itself." The same experienced surgeon joins Sir Astley Cooper in comparing its formation to that of *hemorrhoides*, following absorption of the lymphatics. "If (says the former) you dissect the parts in this stage of the disease, you will find, not only that the skin has ulcerated, but that the tunica vaginalis and the tunica albuginea have ulcerated also; and that the granular structure of the testicle projects through all these openings. You may ascertain the same thing in the living person; for, when the fungus is large, no portion of the testicle remains within the scrotum, and you may distinctly trace the spermatic cord into the cavity of the fungus. There are a few cases in which an abscess forms in the substance of the testicle, and bursts externally, without the protrusion of a fungus; but these are comparatively rare. The long surface of such an abscess secretes the yellow substance which I have described; and you will find large masses of it, with a laminated structure, coming out of the cavity of the abscess. The disease, if it be arrested in the early stage, leaves the testicle with the granular structure but at all impaired. If it be allowed after it has advanced some way, the granular structure is partially destroyed; but if it be allowed to run its course, the whole of the granular structure disappears; and you find in lieu of it a new formed white organized

substance, leaving the consistence of Firmament, but without its fibrous character." In the early stages, the testicle is enlarged to many times its natural size; but, when the disease is suffered to proceed, the large testicle disappears, and merely a knob or tubercle is left, connected with the slender remains of the spermatic cord. (See Benjamin Brodie, in *Ann. Med. Gaz.*, vol. xiii. p. 321.)

This disease was briefly noticed by me in an early edition of another publication, and described as "a peculiar affection of the testicle, in which a fungus grows from the glandular substance of this body, and, in some instances, from the surface of the tunica albuginea. The excrescence is usually preceded by an enlargement of the testicle, in consequence of a haemorrhage, or some species of external violence. A small abscess takes place, and bursts, and from the ulcerated opening the fungus gradually protrudes." I then proceeded to represent how unnecessary and improper it was to extirpate the testicle, on account of this affection, and recommended the fungus to be cut off, or else destroyed with caustic. I founded my advice on a successful attempt of the first kind, which was made in St. Bartholomew's Hospital, by Sir James Esdaile, a little while before my book was published. (See *First Lines of the Practice of Surgery*, p. 389.)

An interesting paper was written on the subject by my friend Mr. Lawrence, who favoured the public with a more particular account, and nine cases illustrative of the causes, symptoms, and progress of the disorder. The patient generally complains some time, or other, of pain, as the cause of the complaint; in other instances, it originates in consequence of laceration of the tunica albuginea, and sometimes appears spontaneously. A painful swelling of the gland, particularly characterized by its hardness, is the first appearance of the disease. After a certain length of time, the scrotum, resting gradually thinner, ulcerates; but the opening which is thus formed, instead of discharging matter, gives issue to a firm, and generally insensible fungus. The surrounding integuments and cellular substance are thickened and indurated by the complaint, so that there appears to be altogether a considerable mass of disease. The pain at times, and the swelling subsides considerably, when the scrotum has given way. In this state, the disorder appears very mild; but if the fungus be destroyed by any means, the integuments run together, and a cicatrix ensues, which is inseparably connected with the testicle. Mr. Lawrence observes, that if the part be examined while the fungus still remains, the excrescence is found to have its origin in the glandular substance of the testicle itself; that the coats of the part are destroyed to a certain extent; and that a protrusion of the tubuli seminiferi takes place through the aperture thus formed. Mr. Lawrence has ascertained the continuity of the connective with the pulpy substance of the testicle, of which more or less remains, according to the difference in the period of the disorder. He thinks that the glandular part of the testicle experiences inflammation; and that in the first instance, in consequence of the violence inflicted on it, and that the enlargement of the swollen substance, by the dense and myeloid-like matter, sufficiently evinces the peculiar kind of the tumor, and the pain which is always attend-

ant on this stage of the disorder. The absorption of the coats of the testis, and of the scrotum, obviates the tension of the parts, and thereby restores ease to the patient, at the same time that the fungus makes its appearance externally.

The excrescence may be removed with a knife, or, if the nature of its attachment permits, with a ligature, so it may be destroyed with sedulous applications. Mr. Lawrence gives the preference to removing the tumor in a testis with the scrotum, by means of the knife, as the most expeditious and effectual mode of treatment. He can discern no general whatever in progressing castration in this complaint, since, in no part of its progress, nor in any of its possible consequences and effects, can it expose the patient to the slightest risk. I remember the time, however, when the testicle was often removed on account of this disease. But no surgeon of the present day would ever think of such a proceeding.

Mr. Lawrence also mentions the possibility of there being other kinds of fungi, which grow from the testicle, and quotes an instance, in which Dr. Macartney found a fungus, of a firm and dense structure, growing from the tunica albuginea, while all the substance of the testicle itself was sound. Dr. Macartney was so kind as to show me the preparation, affording a clear specimen of the second kind of fungus. (See *Edin. Med. and Surg. Journal* for July, 1836.) Gallies represents the excrescence as sometimes originating from the surface of the tunica vaginalis.

Sir Benjamin Brodie, instead of cutting away the protruding mass, which he deems unavoidable, on account of the small waste being thus sliced away, keeps the tumor in the scrotum, and in this way gives him recovery; and after the protruding substance every day with daily irrigated with a weak solution of mercury, and applies over this simple dressing. Under such treatment, the surface was however covered with red healthy granulations. This he, dipped in a weak solution of copper in tannin solution, may be used as a dressing.

The reader will discern some difference in the accounts given of this disease by different writers, some representing the substance as consisting of fungus granulations; and others as being actually a protrusion of the glandular substance of the testicle itself. I shall say, that both forms of disease occur, but that they should not be confounded together.

Epididymitis, or Enlargement of the Testicle.—Sir Anstey Cooper alludes to the frequency of this disease, and to its being sometimes mistaken for one of a malignant nature. "It begins (says he) with a hardness and swelling of the epididymis, is at first unattended with pain, and is discovered by accident after it has acquired a considerable bulk." The testicle at length becomes involved, the firm of the epididymis is preserved, although its size is increased; and its separation from the testis may still be distinctly traced. The latter, when enlarged and hardened, generally retains its usual smoothness, but its form is rounder than usual; frequently, a clear transparent serum fluid is effused in the tunica vaginalis, making use of the terms in which the term *hydrocoele* is applied. "Each epididymis and testis is frequently contemporaneously affected; and hydrocoele takes exists, on one side, but not on the

other; yet sometimes on both sides. One testis may cease to swell, and the other fluid becomes enlarged. The testicle and epididymis continue to grow under great increase, and the spermatic cord is not usually increased, but its veins are a little swollen, and it is consequently somewhat increased in size. When the enlargement in the testis and epididymis is considerable, slight pain and a sense of weight are complained of in the groin and thigh. The disease may remain in this state for months, regularly increasing in size; but from disuse, a distension in riding, such as sometimes is breaking, or other cause, the swelling is disposed to increase, attended with great pain in the part affected, and swelling and redness of the scrotum. These Jacob venereux are relieved by leeches and purgatives; but, in a few weeks, as the patient again takes exercise, and returning in his usual mode of living, the disease is seen more probably to augment. The repetition of such attacks at length makes the patient anxious to have the part removed. In the course of time an abscess forms, denoted by an obscure fluctuation; and, if punctured, a thick pus of test quality is discharged. When the abscess is formed in the body of the testis, the incision always greatly retards the progress of the matter to the surface.

According to Cruveilhier, the body of the testis is affected only extensively; "and then (says he) either the tubercular inflammation takes place along the fibres radiating from the corpus, which, proceeding from the corpus testicularium, penetrate the substance of the testicle; or else tubercles, more or less numerous, form at different points of the texture of that organ." (*Cruveilhier, Anat. Pathol.*, *liv.* 2.)

Sir Benjamin Brodie represents the testicle as being at first somewhat knobby and irregular; but, as it increases in size, and becomes harder, the different knobs seem to run into one another, and, at last, the part constitutes one huge, hard, uniform oval swelling. He admits that the disease generally commences in the epididymis, but not always. (*See Lond. Med. Gaz.*, vol. xlii. p. 220.)

In the dissection of a testicle thus affected, a yellow increased matter is found collected in small masses in its glandular structure; and, in a more advanced stage of the disease, these masses are larger in certain places; while, in others, the glandular structure retains its natural appearance. All this is well represented in Cruveilhier's 9th *Lithiogr.* pl. 3. In a still more advanced stage, the yellow deposit forms distinct hard masses, and generally runs in two knotted. (*See B. Brodie.*) Dupuytren also describes the tubercular degeneration as one of the principal characters of the disease; and he states that, in most instances, it affects the intercellular tissue around the epididymis, and also the substance of the testicle itself. (*Clin. Chir.*, l. i. p. 101.) Cruveilhier, who has published an accurate description of it, illustrated by plates, regards it as the result of chronic inflammation of the epididymis. (*Anat. Pathol.*, *liv.* 1. pl. 1.) In what Sir Ashley Cooper terms the adhesive stage, the testis and epididymis, when dissected, have a general yellowish appearance, and considerable softness. "When (says he) I make a section of a chronic enlargement of the testis, throw it into water, and agitate it, a whitish yellow fluid proceeds from the seminiferous tubules, which are extremely dilated, and the liquor coagulated. But still the same bulk of the

testicle remains, owing to the cellular membrane of the part being loaded with a yellow fibrine; the rete is filled with the same secretion as the tubule: the epididymis is similarly diseased; and sometimes the testicular scirrhus and vasa deferentia are distended with a similar deposit. Cruveilhier gives an example, in which all these parts, and also the spermatic ducts, and prostate gland, contained tubercular matter. Sometimes abscess and phlegmonous matter, and in this case a part of the testicle is destroyed, and the complete recovery of its functions is impossible. Occasionally disease lead into those diseases, the cellular and arteries of which, still accepting semen, are prevented from closing till the secreting surface be healed or destroyed. (*Sir A. Cooper, Op. cit.* p. 37.) The protrusion of high granulations from such abscesses, and termed the granular testis, I have already noticed. Chronic inflammation of the testicle sometimes comes on as a consequence of local injury; but much more frequently as the result of some constitutional derangement, as that from syphilitic rheumatism. (*See Dupuytren, Clin. Chir.*, l. i. p. 88; *Sir B. Brodie, &c.*) According to Sir Ashley Cooper, a often takes place in persons who have been scrofulous in their youth. (*Alb. Dupuytren, vol. cit.* p. 308.) It is frequently the product of a constitutional worm and leads to be interperence. It also follows a long course of mercury; and "it arises in habits in which the vital powers are diminished, and in which we often find a loosening of the cellular membrane in the form of chronic catarrhs. Frequent exposure to wet, cold, or fatigue, and an excessive indulgence of the passions, also dispose to its production. The most frequent accidental cause of syphilitic disease?" (*Sir Ashley Cooper, Op. cit.* p. 30.)

Most of our constitutional secretaries are represented by Cruveilhier as generally beginning in the body of the testicle, tubercular secretions in the epididymis. "The former (says he) are commonly spermatic; the latter mostly arise either from a venereal cause, a scrofulous constitution, or a carcinoma." (*Anat. Pathol.*, *liv.* 1.)

When chronic enlargement of the testicle arises from syphilis, it is sometimes called the *elephant testis*. The eruption of this case, so far as the part itself is concerned, has not hitherto been well ascertained. Indeed, Sir Benjamin Brodie observes, that under whatever circumstances chronic enlargement of the testicle takes place, "the symptoms are precisely the same." He has not overlooked, however, its combination with venereal ulcers, or eruptions, as throwing light on the cases. (*Nat. cit.* p. 227.) Dupuytren remarks, that "it would not seem difficult at first to distinguish venereal enlargements, as those produced by syphilis, from others which are scrofulous: I must confess, however, that, in many examples, they begin absolutely in a similar manner, and do not exhibit their true character till after a certain space of time has elapsed. The scrofulous (he says) do not generally yield to ordinary means; they are indefinitely protracted, are often accompanied by affections of the same nature, and are collected with a scrofulous continuation." (*Clin. Chir.*, l. i. p. 300.) The atrophied chronic enlargement of the testicle is mostly described as coming on without pain or tenderness, except that produced by more distension and the weight of the disease; but, according to Mr. Cusack, the inflammation some-

sionally recurs or rather suddenly, and in a sub-acute form. The disease "commences in the body of the testis; there is little alteration in the form of the organ in the first instance; but, as the enlargement advances, the tumour becomes more globular, the epididymis soon becoming involved, and loss in the scrotal mass; the tumour has a fleshy feel, but differs much in density in different parts. It is said to be somewhat uniform on the surface, and generally a certainty is so generally partial adhesion in the cavity of the tunica vaginalis, however, confined with effusions here that cavity, even independent of the internal changes which they are going on, render this a very uncertain symptom; so uncertain, indeed, and so little uniform are the primary appearances that Mr. Casak believes the best practical figures would be unable to make a perfect diagnosis, if unacquainted with the history of the case and the attending circumstances. The termination of the disease is either resolution, or suppuration, or infarction, and the formation of granular follicles, ending in total destruction of the function of the organ. Mr. Casak has stages to follow, and is able to affirm, from his own experience, that this affection of the testis is met with in the earlier stages of secondary symptoms, or during the presence of any of the forms of true popliteal claps." (See *Edin. Journal of Med. Science*, vol. viii, p. 531.)

"The acute form attended in most with accompanying venereal lentic pains in the testes, and either a scaly scrofula, or perhaps a solitary spot, apparently belonging rather to the genus Acne; but these are instances comparatively rare. The patients who suffer from this form of the disease, amount to labour under affections of the peritonitis and leucæ, and bear the marks of having suffered from pustule and tubercular eruptions." (See *Edin. Journal of Med. Science*, vol. viii, p. 531.)

I once attended with Mr. Donoghue, of University College, a terrible example of phlegmonous abscess of the penis, followed by painful enlargement and ulceration and abscess of the testis, one of which presented the form of a large fungus-like mass, and gradually sloughed away. The patient ultimately fell a victim to the further ravages of the disease. With respect to the diagnosis of a venereal chronic enlargement of the testicle, Dupuytren observes that we daily meet with patients who have a swelling of this organ, for which they are obliged to cauter. They have not received any blow or external injury; the swelling has subsided and attacked the other testicle, or has continued in one or the other as the person lives. "If the tumour is old, or cystic, comes on insidiously, and is attended with a thickened pain when touched, the patient has had old venereal complications, and one testicle, after having been diseased for six months, a year, or a year and a half, has resumed its healthy state, and been followed by disease of the other; there is strong reason to presume that the case is of a syphilitic nature, for a cancerous affection would not thus change its place." (See *Dupuytren*, in *Ch. Clin.*, t. i, p. 167.)

In chronic enlargement of the testicle, though a mild syphilitic may have taken place in the testis, and even in its substance, or epididymis, a cure is yet practicable. This opinion, deduced by Sir Astley Cooper from a full of intimate experience, and delivered by him in his lectures, receives confirmation from every quarter. "A person (says Mr. Cruveilhier) que dans l'état de l'écoulement, les inflammations du testicule

becomment, dans l'épididyme et même dans le corps du testicule, ne sont pas des raisons suffisantes pour l'expectation." (Anat. Pathol., liv. ix.) Sir Astley Cooper directs the patient to observe the recommended position for a month, as he to prevent excitation of the blood into the affected organ. Three grains of calomel and one of opium are to be given every night and morning, and the parts kept bare for at least a month. Every fourth morning a decoction draught with half an ounce of sulphate of magnesia, and fifteen or twenty drops of tinct. iod. is to be prescribed. Leeches are to be applied twice a week, the scrotum dressed three a day, and a lotion of the liq. ammonia. acet., with spirit of wine sulphuric, or else equal parts of castor oil mixture and vinegar. (See *Sir Astley Cooper*, Op. cit., p. 40.)

If mercury be employed, when the disease has not been going on more than two or three months, the testicle will generally be restored to a healthy state; but at a later period, it will not accomplish so much. The mercury will only soothe inflammation that exists, without having the power to remove the structure which has been already destroyed. Mercury may now relieve the pain and tenderness, and diminish the swelling; but some induration and enlargement will remain, over which mercury has no control. (See *R. Brede*, in *Ann. Med. Gaz.*, vol. xii, p. 222.) If calomel or the blue pill disagree with the stomach, mercurial ointment should be rubbed on the thigh. When the swelling is combined with a syphilitic eruption or ulcers, the bichloride of mercury joined with sarcaparilla will sometimes prove the best medicine. Dupuytren found, that small doses of the bichloride had a better effect than full ones; his custom, therefore, was to give three a day one pill, containing $\frac{1}{2}$ of a grain of the bichloride, $\frac{1}{2}$ a grain of extract of opium, and 2 grains of extract of guaiacum. The dose was very gradually increased to $\frac{1}{2}$ a grain of the bichloride, which quantity was never exceeded. The compound decoction of sarcaparilla and codonides were likewise prescribed. (See *Ch. Clin.*, t. i, p. 89.)

When chronic enlargement of the testicle is in the form of hydro-sarcosis, the fluid in the tunica vaginalis is usually absorbed under the influence of mercury, and the same remedies which cure the disease of the testicle, cure also the hydrocele. "There are cases, however, in which the hydrocele attains a large size, and in which the remedies which cure the testicle are not equal to the cure of this secondary disease. Under these circumstances, you should treat the disease of the testicle first by the exhibition of mercury; and after a mercurial course, but not till then, you may inject the hydrocele." "What would happen (asks Sir Benjamin Brodie) if you were to make an error in the diagnosis, if you were to mistake a hydrocele of this kind for a cancerous hydrocele, and inject it before you had cured the primary disease? I did (says he) in one instance—make this mistake, and I will tell you the result. A gentleman (a West Indian) many years ago consulted me about a hydrocele. There was a considerable collection of fluid, perhaps about eight ounces; I found the scrotum somewhat indurated, which I thought was merely from thickening of the tunica vaginalis; I did not, therefore, hesitate to inject the hydrocele. After the operation, no violent inflammation followed, but it did not subside as usual,

small abscess formed in one part of the testicle, which I opened. After this, several abscesses formed in succession in the testicle, which, all the while, went on growing larger and larger. Now I began to see the error which I had committed, and to suspect that the patient laboured under a chronic inflammation of the testicle, the hydrocele being merely a secondary affection. I put the patient under the influence of mercury, and of iodine, so that it acted on the glands, the abscesses ceased to form, the testicle rapidly became reduced, and, in short, another mistake, there was an end both of the disease in the testicle and of the hydrocele; so that, in fact, every thing turned out as well as if I had adopted the proper mode of treatment in the first instance." (Sir B. Brodie, *Op. &c.*, vol. xiv. p. 225.)

Singularities of the Testicle.—I have already noticed the opinion of Baillie, Jussaye, &c., that, although it may not seem difficult at once to distinguish an enlargement of the testicle produced by syphilis, or by an external injury, from another which is scrofulous, yet, in their beginning, they sometimes absolutely resemble one another, and their true character cannot be made out till a later period. "In general (says he) scrofulous enlargements do not yield to common treatment; they continue indolently, are frequently accompanied by other affections of the same nature, and are collected with a stercoraceous consistency." (See *Chir. Clin.*, t. i. p. 101.)

The following is the description given of the scrofulous testicle by Sir Benjamin Brodie. The patient experiences a slight pain in one part of the testicle, and there a little enlargement is felt, generally at one end of the epididymis. Then a slight pain is experienced at another part, and here is perceived another enlargement, which is commonly also in the epididymis. These small tumours increase in size, and gradually become more painful. Sometimes as many as three or four of these tumours are found on the surface of the testicle, generally connected with the epididymis. The skin becomes adherent to them, and one of them is converted into an abscess, which bursts through the external skin. A similar abscess forms in another, and runs the same course. These abscesses discharge very little matter, and they do not heal but a healthy abscess. When a probe is introduced into one of the sinuses thus formed, it passes down into the centre of the testicle, or thence in which the abscess originated. In some instances, the disease will go on, until the whole of the testicle is disorganised. Sometimes it is confined to one testicle; sometimes both are similarly involved. Occasionally it will completely destroy one of the testicles; but, more frequently, the testicle is only partially affected, and a great deal of the scrofulous structure remains in a natural state. In the advanced stage, the testicle sometimes becomes enormously enlarged, and hard throughout, except on external examination, the remains of the prostatic urethra, which extend to the beginning, may be perceived. The disease is generally connected with other scrofulous symptoms; an enlarged gland in the neck, scrofulous disease of the spine &c. &c. or of some of the joints. (See *Lenten Med. Gaz.*, vol. xiii. p. 377.)

It is remarked by Jussaye, that the tubercular degeneration is one of the principal char-

acters of these scrofulous enlargements. In the majority of cases, he says, the disease attacks the fibres of the testicle, surrounded by the epididymis, but that it may also occur in the substance of the testicle itself. The tubercles are developed slowly, and may contain three or four grains. The mode in which they increase, their progress, their long duration, or the signs indicative of their nature. "Scrofulous swellings of the testicle are not confined to a certain age; but they are hardly then those which depend upon inflammation. They are free from heat and redness; and cause a loss of weight and vigour. The scrofulous cellular tissue is uniformly free," he further, Dupuytren should have said it is so, except at the points where abscesses adhere to the surface. "The shape of the tumour is commonly irregular and irregular, while, in a scrofulous enlargement, the testicle is globular, and the epididymis knobby; the systematic cord being nearly spared, but torn and then implicated. As the scrofulous disease of the testicle makes progress, various points within the organ soften, and, when touched, seem as if they contained a soft substance. Soon after the small whitish projections are noticed, the skin thickens, and from the openings is discharged a thin pus, and a yellowish cheese-like or glutinous substance, evidently a product of scrofula. Pustules are next formed, out of which is voided a stercoraceous kind of pus. The disease may go on for years." (Jussaye in *Chir. Clin.*, t. i. p. 301.)

The testicle, even in very young children, sometimes becomes enlarged and very hard, but without pain; and this indolent increase of it may remain for many weeks, months, or years; and, as the health improves, ultimately subside. More frequently the disease comes on at puberty, or between that period and the age of twenty; and, not uncommonly, it attacks both testicles. It suppurates early, which happens even in children, but still more frequently at puberty, the matter often forms in the glands major of the epididymis, though sometimes in the glands minor. According to Sir Astley Cooper, the body of the testicle rarely suppurates "but, after the epididymis has ulcerated, the testis becomes affected, and the scrotum assumes a firm line; ulceration comes, and an abscess forms, which discharges ill-formed pus, and some sperm, at least until the age of puberty; and the opening is extremely difficult to heal, continuing six months, and even for years." The whole testicle is at length wasted, and but a small portion is left, and the seminal secretion almost entirely ceases.

In dissections of the epididymis and testis affected with scrofulous disease, Sir Astley Cooper has found a yellow spot surrounded with a zone of inflammation in the glands major, or sometimes, though less frequently, in the glands minor. When the spot ulcerates in its centre, the matter which is voided is not pure pus, but composed of fibrine and serum, and having a slight yellow tinge. "In the testis there are several solid or yellow spots, accompanied by the same kind of inflammatory case; and several yellow streaks are also found within the testis. Scrofulous abscesses in the testes are sometimes accompanied by a granular swelling like that which exists in the simple chronic disease." (Sir Astley Cooper, *Op. &c.*, p. 92—93.)

Mercury, which proves so efficient in the ordinary chronic enlargement of the testicle, does harm in the serous disease of it. No specific remedy for ascitis is known; but the patient should have the benefit of pure air, and especially of that of the coast. The diet should be antiscorbutic, and ale, or porter, or wine and water to be drunk at dinner. Sir Astley Cooper speaks also in favor of tepid sea-bathing. The medicines which he recommends, are hydr. cum creta with rhubarb; powder of columba with opium and soda twice a day; vitrum argy. three times a day; liqor. ferri ammon. or pills composed of rhubarb and carbonate of iron; quina with infus. rose comp.; liqor. potassæ; the tincture of mercury in dilute doses, joined with the compound decoction of sage and flax, or with tincture of bark, or of rhubarb.

Sir Benjamin Brodie remarks a regulated diet, residence at the sea-side, and the exhibition of steel medicines, or quinine, where they seem to be required, as they generally are. But he has seen more benefit derived from the liquor potassæ than any other medicine. It is to be continued with tincture of quinia, and taken in the dose of half a drachm three times a day, blended with a wineglass of table-wine. The acetate of potash, which may be produced by this mixture, Sir Benjamin conceives has also a good effect by acting as a diuretic. (*Edin. Med. Jour.*, vol. xiii. p. 378.) Preparations of iodine are well known to be serviceable in this disease; and the tincture, or what is better, the iodured solution of the hydrate of potash, may be exhibited with caution.

In the indolent stage, previously to suppuration, the osmament of iodine, or iodineum hydrargyri, may be rubbed on the part, the caloplastum hydrargyri applied, or lotions of the liquor ammon. acet. and opii, sin. used. If the disease suppurates and ulcerates, a solution of one grain of sulphate of copper in an ounce of distilled water may be employed as a lotion, and also as an injection for the sinus, or for cauterizing and hyalizing the sinus; 30 minims of silver lotion are also eligible.

The cystic, or, as Sir Astley Cooper names it, the *hydatid*, or *encysted disease of the testicle*, is comparatively rare, and described by him as a specific, yet entirely a local disease, as he has seen it in persons who enjoyed excellent health, and in whom no relapse occurred after the part had been removed. It is chiefly met with in persons between the ages of 18 and 35; and is alleged to begin with enlargement of the epididymis. It is not painful until the part is large, and the swelling hinders circulation makes pressure on it. When handled, there is no feeling of tenderness manifested, unless the pressure be considerable. The frequently heaving look of the patient is apt to create suspicion of hydrocele. The spermatic veins and those of the scrotum are distended. The natural form of the testis is preserved, being rounded in front, and flattened at the sides, and not so pyriform as in hydrocele. When the swelling is heaved, it communicates an impression that it contains a fluid, for it easily yields to pressure; yet there is no true fluctuation, for the tumor does not rise at one distance, as it sinks under the pressure of the finger; but it yields only at the spot compressed. If strongly compressed, a sickening pain in the groin and loins is produced. The weight of the testicle is obviously increased, and after a time, this causes pain in the flanks; so-

tion, and its bulk is a great inconvenience. The complaint seems to Sir Astley Cooper to be so local, that were it not for its weight, and size, it would scarcely call for removal; for the spermatic cord does not become affected, nor are the adjacent glands of the loins or groin irritated by it.

In the dissection of this disease, the tunica vaginalis is found thickened, and partially adherent; and the tunica albuginea, both of the epididymis and testis, is much denser than natural. The testicle consists partly of a solid structure, and partly of cysts, varying in size from that of the head of a large pin to that of a small marble. The small cysts contain a transparent, yellow, serous fluid; the larger, a mucous secretion. The cysts which contain serum are highly vascular. Sir Astley Cooper suspects the cysts to be enlargements of the seminiferous tubes from obstruction; and on this point he is doubtful. He admits that they are certainly not of the nature of animal hydatids. The cysts in the epididymis do not become so large as in the testicle. There are some fine specimens of this disease in the various pathological museums of London; the best which have been seen are in those of the late Mr. Abernethy, and of Mr. Liston.

The marks of distinction between this cystic disease and hydrocele, are that the former is characterized rather by a yielding than a fluctuation; by a heavier swelling; by the swelling being less pyriform than a hydrocele; by the entire absence of transparency; by the sickening pain caused by strong compression of the tumour; and by the dilated state of the veins of the spermatic cord and scrotum.

The removal of the part by operation is the only means of relief; for the change of structure, attending the disease, manifestly amounts to a disorganization of the part not admitting of benefit from any internal or external remedies. "A system of depletion and abstinence for a week (observes Sir Astley Cooper) will make the patient bear the operation well; and it is one which, for this disease, I never knew unproductive." (*Op. cit.*, p. 88.) The following modification of this statement, however, deserves well to be remembered. "The largest (epididymary) and encysted disease may be contained in the same testis, and then the case may prove fatal; but this will be ascertained by the dissection of the removed part, which will lead to a favorable prognosis in the encysted disease, and to a very decidedly unfavorable opinion in the other. Cruveilhier (*liv. v. pl. 1, figs. 1 and 2*) has given a most correct view and description of one form of the latter unfortunate condition, which he terms *cancer albugineus testis matris pedis*, on account of some of the cysts containing a pearly-colored substance, but others a brown fluid, and others again a puriform matter. In this case, castration was performed, and the wound quickly healed; but six months afterwards, medullary tumours formed in the substance of the bodies of the spermatic vessels and both dorsal vertebrae, and by compressing the medulla, excruciating paralytic, first of the upper, and then of the lower extremities, ultimately paralytic, &c., terminating in death.

Medullary Cancer of the Testis. *Fungus Hæmatodes.* *Psalpy Testicis.* *Medullary Epithelioma.* *Fungoid Disease of the Testis.*—Organic diseases of the testicle are feared to be less common at the present time than they were believed

to be formed, when chronic enlargements of that organ were always confounded with them. The discrimination of one class of cases from the other, the result of which has been to render the extirpation of this part a comparatively rare operation, appears to me to be one of the greatest improvements in modern surgery. Medullary cancer of the testicle, a disease bearing such a variety of names, usually begins with an enlargement of the body of the organ, which is at first attended with considerable hardness, and the swelling often increases remarkably, "so that in three or four months, the whole of the testicle will become enlarged. It then affects the epididymis from one extremity to the other. While the complaint is confined to the testis, the swelling is globular; but when the epididymis is also diseased, it becomes pyriform, and has so much the form of hydrocele as at first sight to be easily mistaken for it. This deception is rendered the more easy, as a small quantity of water is often effused, so that the cavity has been called *hydro-sarcote*. When carefully examined by manipulation, the solid swelling is felt through the water, and the sides are found flatter than its top, which is the form of the testicle in its natural state. The surface of the testicle is frequently uneven; but this symptom is not a concomitant of this disease in its early stages. At first the complaint is not painful; but it is soon followed by occasional darting pains in the part, and in the course of the spermatic cord or the groin and loins, and, if it be much hindered, it leaves a tenderness and increased pain in the part. Its growth is very uncertain; it sometimes increases quickly, and acquires great size; at others, eight or ten months elapse, before the swelling is considerable. It also does not grow steadily and equally; but becomes very painful for two or three days, and during that time rapidly increases; and then it is stationary for two or three weeks." At first, the colour of the scrotum is not changed, and the spermatic cord is not swollen, excepting that the veins are slightly enlarged. In the second stage, it is covered with varicose veins, and the testis, instead of being hard, yields to pressure, and both the elastic feel and the pyriform shape of the tumour raise a suspicion of its being a hydrocele. The spermatic cord becomes enlarged up to the abdominal ring, and the spermatic veins are fuller than natural. The patient's countenance is sallow; sometimes he is emaciated, sometimes he has profuse diarrhoea; his appetite fails; his rest is interrupted by pain; and he falls into a state of great exhaustion.

In the third stage, the testicle becomes adherent to the sperm, and the skin can no longer be readily moved over the tumour. In the groin on the diseased side, one or more abscesses glands enlarge from irritation; and after many glands there have become affected, those in the opposite groin also enlarge. The surface of the testicle now feels knobby and unequal; and sometimes the spermatic cord, besides being enlarged, indurated, and varicose, becomes adherent to the pubes, and at this point the testicle is firmly bound. At length, at a particular point of the scrotum, a purple blush appears, under which a fluctuation seems so distinct, that the surgeon is often induced to make a puncture; but merely blood is discharged. Although the wound thus made heals, yet soon afterwards ulceration ensues, and a fungus, pyæmia, blood,

and discharges a profuse quantity of thin serous fluid, which has a peculiar salt about it. In two or three weeks, the ulcer spreads to the breadth of the palm, sloughs frequently, is extremely offensive, occasionally very painful, but not tender to the touch; and if the testicle be compressed, a brain-like substance issues from the fungus. At last, the patient sinks from want of sleep, from discharge, and continued irritation. (Sir Astley Cooper, Op. cit., p. 118-120.) I have never seen the disease in that advanced condition where ulceration has occurred, and a mass of fungoid substance has protruded. I believe, with Sir Benjamin Brodie, that the impossibility of doing so are rare, because the testicle is generally unattached, or the patient dies long before the disease gets to this point. It is certain that the tumour may grow to an enormous size, without any alteration of the scrotum, or protrusion of the medullary substance taking place. In one or two examples, in which I was led by the elastic feel of the tumour to make a puncture, the wound healed up, and never gave any further trouble. This agrees with the observations of Sir Benjamin Brodie; but I should remark, that the punctures in my cases were made at an earlier stage than that referred to by Sir Astley Cooper, the purple blush not presenting itself at the point where the lancet was introduced.

The writings of Professor Cruveilhier convey most accurate views of the chief characters of medullary cancer, or cephaloma, as he calls it. In his able work, entitled "*Essai sur le Cancer de l'Élémentaire Forme de Brame*," this subject is considered in a manner which cannot fail to be highly interesting to every surgeon into the pathology of surgery. But as I have noticed his statements in other articles, (See CANCER, and FUSCIGENOUS,) it is unnecessary here to repeat them. With respect both to testicular and medullary cancer, sometimes the new deposit takes place in the molecular structure of the part affected, after the manner of carcinoma; while, in other instances, it is thrown out on a free surface, rather as the manner of secretion; or, as Sir Benjamin Brodie has explained, there are some cases, in which a particular organ loses its natural structure, and becomes converted into a diseased one; and there are other cases, in which the morbid growth is altogether a new formation—a tumour, growing in a particular part of the body, which remains entire, and retains its natural organization. Now, with respect to medullary cancer, or *fungus haematoideus*, it appears that, in some cases, the glandular structure of the testicle is actually converted into this diseased structure; but there are others in which the new deposit reflects in a distinct mass, and the glandular structure of the testicle is, for a time at least, entire. Sometimes the new deposit accumulates in a mass in the centre of the testicle, and the glandular structure is expanded, as a thin layer, upon its outside. Mr. Wardrop relates a case, in which the glandular structure was natural, the tumour having grown from the surface of the right testis, immediately beneath the tunica albuginea. Sir Benjamin Brodie refers to a specimen, in which the glandular structure of the testicle is actually converted into this diseased mass, while there was a large medullary tumour completely occupying the cavity of the tunica vaginalis. Whenever distinct the testicle may have been in the first instance, it becomes at last converted with the disease; and there is then a tumour of an oval shape, and in this respect different from hydro-

cells. It is also harder than a hydrocele; opaque instead of being transparent; harder in some parts than others; and without the smooth regular surface of hydrocele. The volume and elasticity of the tumour, however, have often caused it to be mistaken for hydrocele, and "parietaria." (See *Monro on Purgas, Hemorrhoids, &c.*, in *Med. Chir. Trans.*, vol. iii. p. 63.)

Notwithstanding the decided feel of fluctuation, dependent on the elasticity of the swelling, a well-informed surgeon will accurately arrive at a correct diagnosis; but if there be doubt, Sir Benjamin Brodie sometimes punctured the tumour with a very small incision. "If it be a hydrocele, the serum escapes, and the tumour disappears; but if it be parietaria, there comes out a little blood, and that is all. No harm is done by the puncture." The identical test escapes, and the wound heals. (See *B. Brodie, in Trans. Med. Soc.*, vol. xii. p. 303.)

I have already mentioned the occasional combination of the disease with hydrocele, constituting one of the cases, sometimes termed *hydro-sarcocoele*. More frequently, the cavity of the tunica vaginalis is obliterated by adhesion; or there may be partial adhesions, and partial hydrocele.

In the dissection of a testicle, which was the seat of this disease in the early or first stage, Sir Astley Cooper found, that the excessive tumescence of the part did not arise from the solid nature of the substance deposited in it, but from the excessive distention of the tunica albuginea, and from its increased yielding to the pressure from within. "The substance which was external was globose, of a yellowish white colour tinged with blood, partially vascular, and, when incised, it became flocculent, and had the appearance of matted wool. The seminiferous tubes could be observed at that part of the testis; but, in other parts, they remained entire. In the dissection of the testis in the second stage of the disease, it is found filled with a similar soft and white fibrous matter, which occupies the testis and epididymis, and the parts of which readily yield to pressure. And there is intermixed with the soft condensation a yellow fibrine." When incised in this state, the soft fibrine is retracted, and the testicular septa of the testis in which it has been exposed are left, representing a kind of cellular straggles. In the third stage, when the testis is excessively enlarged, the tunica vaginalis contains a good deal of fluid; the tunica albuginea has given way, and a portion of the diseased projects through it. The interior of the testis may likewise contain cysts of serum, as well as coagulated blood, and the white soft fibrous matter closely reflected, from which, when compressed, a substance issues like cream tinged with blood, and sometimes coagulated to pinted lumps; the epididymis is enlarged, and when serum has not been effused, the vascular signals are adhering to the testicle. (See *Astley Cooper, Op. cit.*, p. 121.) The same distinguished surgeon notices the frequent enlargement and induration of the spermatic cord, and his explanation from the disease in certain other cases which have even had a fatal termination. On this point Sir Benjamin Brodie remarks, that "when the disease first exists, the spermatic cord is in a natural state, and, in many cases, it never seems to be much enlarged; but, in other instances, the disease extends to the spermatic cord, and this to a very great extent.

Seeing this, you will not wonder that disease should take place in the testis, when some parts of the spermatic cord originate. The disease, however, will show itself in the testis, although the spermatic cord be healthy. This I have seen many times in examining bodies after death." (See *Lect. Med. Gen.*, vol. iii. p. 408.) The same fact was exemplified in a case in University College Hospital, where, at the autopsy on the body of the patient, a man about 30, I observed a testicle affected with this disease; and, though the afterwards felt a tumor in an extensive measure of the same nature in one of the lumbar glands, the portion of the spermatic cord removed, and also that left within the inguinal canal, were free from disease. In another case where I operated, the part of the cord taken away contained little bodies like millet seeds in size; and, notwithstanding this extraordinary circumstance, the patient recovered, and was apparently in health, at least two or three years after the operation; and, so far as I know, my own patient well to the present day, which is six or seven years from the time when the testicle was removed.

Frequently a quantity of serum is found in the abdomen, and behind the diaphragm, "a large tumour, to which that immense adhesion on the forepart, and the aorta and vena cava are placed behind it. It is in different subjects of a size from that of the clenched hand to that of the head of a child. When cut into, it contains a soft, but still a solid fibrine, with which is intermixed a fluid like cream, slightly tinged with blood. In some persons, the tumour in the abdomen begins from the lower part of the liver, and extends to the diaphragm, involving the kidneys; and, when it is attempted to be dissected, a large quantity of a thick cream-like matter bursts from it at different parts. The aorta and vena cava are dissected, and numerous tubercles and effusions are produced in their coats, and fungus (mucillary) effusions into the cavity of the aorta." In many of these cases the mesenteric glands are similarly diseased. Frequently the liver is loaded with tubercles of the same nature; and in the museum at St. Thomas's Hospital is a preparation in which the thoracic duct is obliterated by this disease. (See *Sir Astley Cooper, Op. cit.*, p. 121-124.) In an example dissected by Mr. Lawrence, the swelling of the testicle consisted of cellular septa, filled with pulpy matter; numerous tubercles of the disease were found in the osmentum, and in various parts of the pelvis, intermixed with recently effused coagula. A mass of soft matter, equal in size to a man's head, lay on the spine, behind the aorta and vena cava, which last vessel was closed for some extent. The spermatic vessels could not be found. (See *Med. Chir. Trans.*, vol. vii. art. 18.)

The young man from whom I procured a testicle in University College Hospital, an example of this disease, was afterwards destroyed by the effects of an enormous swelling of one of the lumbar glands, which was as large as a man's head. It not only compressed the diaphragm and vena cava, but a portion of it had made its way into the pelvis of the kidney. This patient suffered excessive pain for several weeks before he died, and was reduced to an extreme state of emaciation, the stomach having been able to retain scarcely anything in it. The swelling of the lumbar gland could be plainly felt through the abdominal parietes. It is covered by the

B. Brodie, that "in many cases the tumour in the loins gives the patient no pain, and but little inconvenience; while, at other times, it is attended with the most extraordinary suffering. A gentleman (he adds) with whom I was acquainted many years ago, had this disease of the testicle; Mr. Cline was consulted, and he recommended the amputation of the testicle, and performed the operation. A year afterwards, the patient became weak in his lower limbs, and at last they became completely paralytic. He died; and, on examining the body after death, there was found a large tumour in the loins, which had affected the vertebrae, so as to put pressure on the medulla spinalis; thus accounting for the paraplegia." (*Sir B. Brodie, in Lond. Med. Gaz.*, vol. xiii, p. 406.)

Dr. Macdonald has recorded 26 instances, in which the patient died of peritonitis; the particulars contain several circumstances in the preceding account. "The abdominal cavity contained a great deal of sero-purulent fluid. The peritoneal coat of the stomach and intestines was extensively inflamed; and covered with patches of lymph. The liver was enlarged, softened, and had a mottled appearance. There was a tumour nearly as large as a child's head, situated under the transverse arch of the colon, and covered by the small intestines. *Refray* clung upon the spine, and was firmly attached to the duodenum, liver, and left kidney. A section of the mass showed it to be composed of a soft brownish substance, which resembled brain mixed with blood, and from the more solid parts a fluid, like yolk, was squeezed out. The inferior part of the testicle presented the same appearance and structure as the abdominal tumour, but the upper half was firm, grayish, and slightly fibrous. The epididymis was enlarged; the tunica albuginea thickened. &c. The spermatic cord was sound." (*See Macdonald's Hospital Reports.*)

In Sir Astley Cooper's valuable work on the *Structure and Diseases of the Testis*, is an interesting plate (viii.) representing the appearance presented in an instance where the castration had been performed, but a relapse occurred. There the end of the spermatic cord is seen forming a considerable tumour; a large tumour may be noticed in the groin; and a very considerable mass between the left kidney, ureter, and sigmoid flexure of the colon.

The only chance of a cure (and this is a very poor one) must be derived from the early performance of castration, before the disease has extended to the tubular or testicular glands, or far up the spermatic cord. Indeed, every little hope should be placed in the removal of the testicle; for cancer humours appear to be either constitutional, than a local disease. Nearly every case on record has terminated fatally, and, upon dissection, either the liver, the lungs, the brain, the limbs or musclicular fibres, or other internal parts, have been found affected with the same disease. In one case dissected by Mr. Lawrence, tubercles of a similar structure to the disease in the testis, were found in the lungs, heart, and, as shewn, in nearly all the other organs and abdominal viscera, though the contents of the scull were free from disease. (*See Cases related by Warton, Earle, Langstaff, and Langstaff, in Med. Lib. Tenax*, vol. iii. and viii.)

Mr. Travers states, that he has never known an instance of the relapse of the disease after castration. (*See Med. Lib. Tenax*,

vol. xvij, p. 339.) And see Astley Cooper observes, that of all the operations of surgery, there is scarcely any which is so generally successful as that of castration for this disease; and there is no hope of the patient's life being saved, unless the operation be performed as soon as the nature of the complaint is ascertained. (*Ips. cit.*, p. 331.)

Dr. Baillie observes, that the testicle is often found converted into a hard mass of a brownish colour, and generally interspersed with humours. Sometimes there are cells in the tumour, which are filled with a creamy fluid. (*Medical Anatomy*, &c., pp. 352, 353, ed. 2.) This is what is usually termed the *scirrhous testicle*, which is attended with great hardness, severe pain, depending along the spermatic cord to the loins, and in unequal knotty feel. In general, the health becomes impaired. To use Mr. Pott's words, sometimes the fury of the disease breaks to rest, but making its way through all the membranes which envelope the testicle, it either produces a large foul, thickening, phagdenic ulcer, with hard edges, or it bursts forth a painful clotting fungus, subject to frequent hemorrhage. (*Pott's Chir. Works*, vol. ii, p. 330, edit. 1808.)

Pott's description probably comprehends several forms of disease, and confounds them together, as for instance fungus phagdenic, scirrhous cancer, and even chronic enlargement with formation of ligamentous granulations and a portion of the substance of the testicle. Now, it deserves attention, that the kind of disease formerly recognized by surgeons as *scirrhous* had center of the inside, and specified by Dr. Baillie, is found at the present day to be an all kinds of a common occurrence. Mr. Travers declares himself "incredulous as to the fact of the scirrhous cancer affecting the testis." (*Med. Lib. Tenax*, vol. xvii, p. 327.) Sir Astley Cooper remarks—"I much doubt the existence of this disease in the same form and appearance as it assumes in the breast, viz., an excessively hard swelling, interspersed by a network of strong fibres, or bands. I have seen a few instances of a very solid enlargement of the testis, accompanied with great weight, attended with severe occasional pain, beginning at the body of the testis, never becoming soft, like fungus, or producing a fungoid and very vascular bleeding surface, and being tuberculated, irregular, and excessively hard, but never becoming so large as the fungus disease; the pain extending to the loins; the spermatic cord enlarged, hardened, and thickened; a smaller tumour than that of the fungus disease, forming in the abdomen; some water is secreted into the tunica vaginalis." At length, a description of the disease into the cellular membrane of the leg and thigh of the diseased side is prototypically, and then the other leg becomes similarly affected. On dissection, instead of the scirrhous tumour, a hard white substance is found in the bodies of little vascularity, and sometimes interspersed with small particles of cartilage, or bone. The epididymis contains the same kind of substance; and the spermatic cord, which is enlarged, has small white nodules in it. The tumour in the abdomen is also of a white solid texture, very unlike that of the fungus disease. This disease has less tendency than the fungus or medullary to involve different parts of the body together, and is slower in its march to its final termination. Hence the disease affords more time for the trial of calomel and opium, with

leeches, expurgating lotions, and the permanent pessary, but, as Sir Ashley Cooper rightly adds, great care must be taken not to do for the operation of castration so long, as to let the disease implicate the spermatic vessel, or a tumour to be formed in the gland.—(*On the Structure, &c., of the Testis*, p. 152–153.)

Neuralgia of the Testicle. *Testicular Testicle.*—By these expressions is signified a highly sensitive and exceedingly painful affection of the part, generally unaccompanied by any swelling, or other obvious change in it. The suffering is frequently of the most excruciating kind, and of long duration, though subject to occasional remissions. “A patient frequently complains of pain in the testicle when there is no disease in it. There is a state of the nerves of the part, which makes him feel pain in it, although there is no inflammation, and any other actual disease; and this is all that we mean when we talk of a neuralgic affection in this or any other part of the body.” You furnished an example of it in persons in whom a large calculus passed from the kidney to the bladder. As soon as the calculus has passed a little way down the ureter, the patient complains of pain in the testicle, which is at the same time frequently drawn up by the spasmodic action of the cremaster muscle into the groin. When you examine it, you find it of no other size, natural shape—at first not very tender, although exceedingly painful; in short, there is a painful affection of the testicle, dependent not on any disease of the organ itself, but on the influence which the calculus, as passing down the ureter, exercises on the spermatic plexus of nerves. Disease in the kidney will sometimes produce pain in the testicle, although there is no reason to believe that a calculus, or other solidness, has escaped from the kidney into the ureter.” (*Sir Benjamin Brodie's Lect. Med. Edin.*, vol. xii. p. 620.) From the observations delivered under the head of *Neuralgia*, the reader will perceive, that neuralgic affections may depend upon a great variety of circumstances, and especially on derangement of the general health. In the dissection of a testicle that has lost the loss of neuralgia, no change of structure can be found. In one instance which I attended, there was occasionally a little enlargement of the organ, though the most part remained free from all swelling or other manifest alteration. If the complaint be connected with functional disturbance of the liver or stomach, the chance of relief must depend upon the possibility of curing this primary affection. In many cases, which appear to be entirely nervous, or not associated with any other perceptible fault in the system, large doses of the sulphate of quinine, or of the carbonate of iron, may be prescribed; or, if the disease assume an intermitting type, and come on periodically, the *ferreus aperientis*. In some cases, the mixture of nuxvomica, opium, or hyoscyamus, brand with calomel, will answer best; and, if the liver be disordered, and the secretion of the skin checked, calomel, opium, and James's powder, should be tried. As frigid applications, leeches, ice-bag lotions, ice itself, or a plaster, one third of which consists of extract of belladonna, and two thirds of soap curate, or the venous sinistram, deserve to be particularly specified. For additional remarks relating to neuralgic affections, see *NEURALGIA*.

Atrophy, or wasting of the Testicle.—Sometimes this organ is either partially or completely

absorbed. This may happen from a blow or other injury which causes violent inflammation of the part, and disorganization of it. Obstruction of the vas deferens has been observed to be attended with a shrinking away of the testicle; a circumstance which would be expected from the necrosis of the functions of the organ being necessarily destroyed by such obstruction. Varicocele sometimes leads to atrophy of the testis; and sometimes the atrophy of the principal spermatic veins with a ligature or ligatures, adopted for the cure of varicocele, has been followed by this change in the testicle. Acute inflammation of the testicle from gonorrhoea, chronic enlargement of it from other causes, and especially scrofulous disease of the organ, may, in the end, lead to atrophy of it:—is the first case, possibly, in consequence of the vas deferens becoming sometimes permanently obstructed; but in the other two examples, no doubt, from disorganization of the testicle itself. The pressure of a large hernial swelling I have, often known occasion atrophy of the testicle; and the strong compression of the spermatic cord by a tumor would appear to be capable of producing the same consequence. Atrophy of the testicle was remarked by Baron Larrey to occur with remarkable frequency after the deep amputation of the back of the neck, received by the French soldiers in Egypt, in their conflicts with the Turks. Gonorrhea and excessive venery are believed to lead in some instances to atrophy of the testicle.

The inflammation and swelling of the testicles resulting from effusion of urine in the scrotum, and often accompanying testis is gonorrhea, will subside after the disease of the urethra has been cured. (*See J. Choquet, Pathologie Clin.*, p. 44.) Every surgeon of experience must have witnessed this fact.

The late Mr. Ramsden thought, that some sarcoles might be relieved by removing with heparina a supposed mercurial irritability of the testis, with which his theories led him to connect the origin of the complaint. (*See Pract. Obs. on Syphilis*, &c.) No doubt many chronic enlargements of the testicle have subsided during this treatment, especially when aided by calomel and other means; but a doubt may be entertained whether the benefit has any essential share in producing the benefit obtained. The practice, at all events, is not at present much adopted, though, on the first suspicion of it, many trials of it were made.—C.]

[Dr. Fancourt, of Philadelphia, has had occasion, very frequently, to remove scirrhus testis, and in all the cases attended with excruciating suffering, the disease has returned in the abdominal viscera or lumbic glands; and does the freedom of the vas deferens from the disease, afford any guarantee against its return, according to his experience.—Ramsd.]

[TETANUS. Dr. Alex. E. Hosack, of New York, has succeeded in curing two cases of tetanic tetanus by the free use of wine and brandy, and in one instance so completely was the patient saturated with these potations, that an attack of delirium tremens supervened, which was well characterized, and to this Dr. Hosack attributes the cure. In both cases the patients laboured under the most violent symptoms of the disease, and epistaxis was present. Dr. Deland was also in attendance and witnessed the favorable result.—Ramsd.]

[TISIA. Dr. J. C. Warren has cured the

this for tracheotomy four cases, in three of which he was successful. Dr. McClellan has repeatedly removed the iliac, lumbar, and femoral, tubercular abscesses.—*Reiser.*

[TONGUE. Dr. Thos. Harris, of Philadelphia, has twice extirpated the tongue for hypertrophy of that organ, and the patients have recovered. Dr. Minger, of the same city, has lately repeated the same operation with entire success. Dr. Minscy reports a similar operation in the *Amer. Jour.*, for 1835. In the same journal, for 1836, Dr. Dugan, of Louisiana, reports a case, in which he removed a greater portion of the tongue by ligature.—*Reiser.*]

[TONSILS. Dr. Alex. E. Brodie, of New York, was the first surgeon at America who removed the tonsils by excision, instead of the ligature, which had long been employed for the purpose. He published a paper on the subject in the *Amer. Jour.*, for 1827, which first called the attention of the profession to the use of the knife, which, under various modifications of instruments, is now universally used. Dr. Physick promised for many years the removal of the tonsils by the use of a double canula and iron wire, but the inconvenience often occasioned, by the troublesome sequelæ of this method, induced him to adopt excision as early as 1827. At first he used the scissors, but soon constructed an instrument for removing the tonsils or tonsils, which is described in the *Amer. Journal*, for 1827. Dr. Hirsch and Dr. Stinson, of New York, and Dr. Fajststock, of Boedapine, have each devised instruments for the purpose, and Dr. Gibson, of Philadelphia, describes one of his own in the late edition of his *Institutes and Practice of Surgery*. Different American surgeons and instrument-makers have mutually modified these instruments, and Mr. Thomson, of New York, belonging to the latter useful profession, has devised one which is very generally preferred to all others, as it serves to fulfil all the indications, and obviates all the dangers occasionally incident to the operation.

In the Philadelphia Med. Examiner, for 1828, Dr. John Mason Warren has a paper on enlargement of the tonsils, attended by certain deformities of the chest, which he has observed, particularly in children. His father, Dr. John C. Warren, has removed the tonsils by excision, 260 times. To guard against the hemorrhage which has occurred when the tincture has been used, he employs an instrument of his own, having an oval aperture to receive the tonsil, and a concave cutting blade is attached, which excises it readily, the pillars of the palate being forced back and protected. Necessities of these operations were rendered necessary by the difficulty of breathing, either occasioned by the enlarged tonsils, or co-existing and relieved by their removal. The next year for deafness or imperfect articulation.

Dr. Warren has closely investigated all his cases which were accessible, since the publication of Dr. Parish's paper on the Change of Voice, which he ascribes to the excision of the tonsils, never having before observed it, nor has he since found any corroborative evidence. He thinks that there must have been a wound in the pillars of the palate in each example as those of Dr. Parish, in which this change of voice occurred, and he remedies it to the satisfaction of the instrument which must have been employed in their excision.—*Reiser.*]

[TRACHEOTOMY. Since the note inserted

under the head of bronchiotomy was prepared, I have had occasion to perform this operation upon a child nine years old, who was near suffocation from the presence of a tamarind seed in the trachea. The parents, and other diagnostic symptoms, fully satisfied me of the presence of the foreign body, but on opening the trachea, inspection could not be detected. The opening was enlarged, and suffered to remain open half an hour, but nothing could be seen or felt of the seed, although the alarming symptoms subsided, and the child immediately relieved was obtained. I felt assured that the foreign body was lodged below the incision, perhaps at or near the bronchial bifurcation, and did not despair of yet accomplishing its removal. An obstinate cough continued, with intermitting fever, for several days, when a small portion of the seed came up by expectoration. But it was not until three weeks had elapsed that the main body of the tamarind seed came up, during a paroxysm of coughing, and the little patient is now convalescent.

In this case, although the operation did not immediately accomplish the object to which it was directed, yet there can be no doubt that it preserved the life of the patient; for at the time of its performance, the child could have survived but a short time. The decided improvement in the respiration which supervened upon the operation, and the absence of every bad symptom, said to be apprehended after bronchiotomy, satisfied us fully of the safety and utility of opening the trachea in dangerous cases of tracheitis from any cause. For although the opening was made of a crucial form, first by dividing the cartilage between the rings, and then by a longitudinal incision half an inch in length, yet, after leaving it open half an hour, it was closed by adhesive plaster, and in less than a week had entirely united; the air freely escaping at the opening, at intervals, during the first few hours.

Dr. Thompson, of Watrous, has performed this operation five times successfully, for the removal of foreign bodies and for croup. In the Med. Trans. of the State of New York, for 1813, he describes new instruments for this operation; and, indeed, for all operations upon the chest, including a stethoscope for keeping open the parts divided, and which he regards preferable to tubes.

The late Dr. Physick recommended this operation in the treatment of hydrophobia, as long ago as 1802, in a paper published in the *New York Med. Repos.* for that year. He was led to make this suggestion from observing, in a fatal case, that the spasmodic contraction of the muscles of the glottis kept the patient suffering for days with affable hoarseness of impending asphyxiation, respiration being at times wholly suspended. To this morbid condition he attributed the dread of water, supposed to be characteristic of hydrophobia. Whether he ever had the opportunity afterward of trying the efficacy of tracheotomy in such a case, I am not informed.

Dr. Mead has repeatedly performed this operation for the removal of extraneous substances from the trachea, or trachea, with uniform success, except when the foreign body has been lodged in one of the bronchi; and in one example which proved fatal, after this operation had been performed, a piece of the kernel of a walnut was found impacted in each bronchus.

A few months since, he removed a large black shawl pin, two inches in length, and having a

head nearly the size of a small marble, from the trachea of an infant eleven months old. It had been there fully eight years, and though its length presented great difficulty in its removal after getting hold of it, yet it ultimately succeeded, and the infant recovered.

As this operation is generally required in children, it is always difficult, especially as the emergency often demands its performance by candle-light. One thing is important to be remembered, viz., that for the success of tracheotomy, great caution is indispensably that it should be performed very slowly, and especially that the opening must not be made into the trachea until every drop of blood has ceased to flow. Without this precaution the child may perish from asphyxiation, even though only a very small quantity of blood may have entered the trachea. This catastrophe has resulted from this operation, and in one recent case occurred in this city, and in the hands of a reputable surgeon.—*Revue.*

[**TREPANING.** Dr. J. C. Warren, of Boston, has twice cured epilepsy by trepanning the skull. In one case of paralysis, for which he performed the same operation, he was unsuccessful. In the *British Med. and Surg. Journal*, he has published a case of neuralgia of the inferior maxillary nerve, for which he applied the trephine in the range of the lower jaw, and cured the disease by this operation.—*Revue.*]

[**TUMOURS.** Under this head I am permitted to add a highly interesting case of tumour of the neck, in which the operation for its removal was performed by Professor Alden March, of Albany, N. Y. And although this operation was unsuccessful, yet the cause of its failure was apparent, and ought to be known to the profession, that it may be avoided in future surgical wounds, in which the neck is to be involved. This operation was performed in August last, and the patient died on the table, from the introduction of the air into the cavity of the heart, through the external jugular.

The tumor was as large as a pint-bowl, occupying the left side of the neck, somewhat egg-shaped, having its largest extremity turned upwards, ascending on the side of the ear, so as to project it considerably, and inferiorly extending nearly to the clavicle.

The following are the report furnished of the operation:—The notes taken at the time:—

The first incision was commenced under the fold of the ear, and, pursuing a curvilinear direction, terminated in the sternal tubercle of the clavicle. A second incision was commenced in the line, and within an inch of the top of the tumor, and extending downwards in an opposite direction, terminating within an inch and a half of the sternum. A third was commenced upon the edge of the jaw, at an inch distant from the clavicle, and curved backwards and upwards, so as to form a right angle with the top of the first, and terminating at the posterior and superior portion of the tumor, the progress of the temporal vein.

The anterior flap was raised and turned over the larynx which exposed the surgical throat, inasmuch as the muscular fibres of the pharynx, and oesophagus were obliterated. The trachea was divided near the anterior margin of the sternohyoides, thus leaving the extent of nearly two inches, which exposed the muscular fibres of the sternohyoides. In the angle formed by these and the lower and anterior portion of the internal

muscle, the carotid artery was exposed and secured with two ligatures.

The next step in the operation was to separate the upper part of the tumor from the base of the jaw, the submaxillary and parotid glands, both of which were found to be in a perfectly natural and healthy state. At the point where the internal or facial artery passes through the submaxillary gland, it was divided, or a large branch of it. It died quite freely, although the collapse could not just be observed. This branch must have derived its blood from the internal carotid of the opposite side, by the way of the circle of Willis, by the vein, or by the superior thyroid of the opposite side, or perhaps from these several sources. This and the carotid were the only arteries which were secured by ligatures.

The next step in the operation was to dissect the posterior flap from the surface of the tumor, when it was found that the muscular fibres of the sternohyoid-muscles were completely obliterated over the centre of the tumor, it reduced to a mere tendinous fasciculus. The dissection was then directed to detaching the tumor from above and below, of course dividing the chief branches of the carotid, as well as the trunk, the pneumogastric nerve, and the great internal jugular. At this period of the dissection the tumor became loose, and an immediate and successful completion of the operation was confidently anticipated. But while carefully dissecting at the lower part of the attachment of the tumor, the external jugular vein was divided very near the point at which it unites with the internal jugular. At this moment a phenomenon occurred which was most alarming. It was the issue of a strange column of air, as though the trachea or cavity of the thorax had been cut into, and seemed to threaten the instant dissolution of the patient; a noise resembling the sudden pouring a liquid from a pump-bottle. The patient was instantly seized with tremors and convulsions, became paleless, the lips turned livid, froth at the mouth, and the pupils dilated to the greatest possible extent. The moment the occurrence happened, the finger was placed on the mouth of the wounded vein, and the operation being suspended, the patient seemed to revive from the effects of diffused air, and partially relaxed. The operation was soon resumed, and very soon completed. The patient, however, expired without a struggle before he could be removed from the operating table.

That this patient died by the introduction of air into the cavity of the heart, there can be little doubt, and this fatal operation of the neck should teach us the imminent danger of opening veins in the vicinity of the heart; and the knowledge of this danger may save many lives, which might otherwise be lost by a surgeon's mistake. It is unfortunate that the case reported by M. Dupuytren, of a similar operation with the *facial* vessel, has not been noticed in our medical works, and still greater cautions might have been used in this case. Dr. March informs me, that Professor Stevens, of this city, had well nigh lost a patient from the same cause, while operating on the neck; and Professor Morton had in similar an operation in consequence of this occurrence the convulsions were so alarming. This point, however, as well as that of Professor Brown, is covered.

Dr. March, the operator in the foregoing case here detailed, had since tried some experi-

ments on inferior animals, and among others, he introduced a blow-pipe into the jugular of a cat, and a single puff of the breath resulted in convulsions and death; and on dissection, the right side of the heart and larger veins were found filled with air. His experiments on this subject may be of the highest practical importance; and the explanation of the remarkable phenomena which followed the wounding of the vein in this and other cases, is a physiological problem, the solution of which, if accomplished, will be of the deepest interest to the profession and to humanity.

Dr. J. C. Warren has published an invaluable work on Tumours, which, at point of variety of pathological and surgical information on this topic, is superior to any other in the English language. This distinguished surgeon has twice removed the parotid gland, and in twelve cases dissected out lymphatic glands from the parotid region. He has removed forty-four submaxillary glands, two sublingual; and twice has extirpated one half of the thyroid gland. He has also successfully removed four tumours from the vaginocervical region.

Dr. G. W. Norris, of Philadelphia, relates an interesting case of protruding tumour in the head of the tibia, in which the femoral artery was tied without permanent result. For this case, and an accurate account of the pathological appearances, see *Amer. Journal*, No. 50, p. 283.

Dr. A. U. Stevens, of New York, has published a clinical lecture on the operative surgery of tumours, abounding in discriminating precepts of practical character, the merit of his extensive opportunities in public and private practice, and of his untiring success in this department of surgery. His two rules for guidance in the extirpation of solid tumours, which he very properly urges in this lecture, should ever be present in the mind of the young surgeon, viz.:—1st. Cut down to the tumour before its dissection is commenced; and, 2d. Remove the whole of the tumour and nothing more. In no department of the art is there more blundering surgery, and more culpable mal-practice, than in the removal of tumours by surgeons who have failed to learn, or neglected to observe these rules. By adopting the first rule, I have seen a tumour removed from the axillary region, and the plexus of nerves, as also the axillary vessels, artery, and vein, were completely exposed, while, by keeping close to the tumour they were all saved, though in intimate proximity, and no secondary hæmorrhage followed. The surgical union to perform such operations quickly cannot be so highly regulated, and tumours, especially, should never be extirpated in a hurry, for that which is well done, is soon enough done. Dr. Stevens has never taken up the carotid artery in the removal of tumours from the neck, and doubts if it is ever necessary.

By observing his rules, he has removed a large tumour beneath the mastoid muscle, which contained the sixth pair of nerves in one part, and the common carotid artery, the internal jugular vein, the p. vagin., and œsophagus in another part, without wounding either of these important structures. In several instances he has exposed the important nerves and blood-vessels bare, except covered by their sheath from the styloid to a point above the bifurcation of the carotid artery, and has never known secondary hæmorrhage or oblique to follow, the sheath of these vessels and nerves being sufficient for their sustenance.

Dr. Geo. McClellan, of Philadelphia, has removed the entire parotid gland nine times successfully, and in a majority of the cases the patients have had no return of the disease. He secures the hæmorrhage by tying the external carotid, under the digastricus, and in the course of the operation has found it necessary to tie the internal maxillary and the temporal. He tied the external carotid twice in three cases, but does not think it either necessary or expedient. He has removed parts of this gland in mutilated cases, when involved in tumours. He has five times removed one half of the thyroid gland, and in one case removed this gland entirely. In this instance, after tying both the superior and inferior thyroid arteries on both sides, he restrained the oozing of blood by the use of six of Hall's vessels, one just being placed upon the spine, and the other over the vocal, and relying upon the spring of the instruments for compression, which he finds does not impede respiration.

Dr. J. Mosen Warren has followed the example of his illustrious father in excising innumerable tumours, and with the like success. He has removed four large tumours from the neck; two large submaxillary glands, and two large tumours from the groin, which closely resembled hernia in their form and locality. In all these cases the operations resulted happily.

Dr. Mott and Bell, of New York, Dr. N. R. Smith, of Baltimore, Dr. Mossey, of Cincinnati, Dr. Warren, of Boston, and many other surgeons in America, have successfully removed tumours including in their structure the entire parotid gland. But to Dr. McClellan, of Philadelphia, belongs the merit of being the first surgeon in the United States to perform this operation, which he did in 1825. His patient, Dr. Graham, is now living in New York, and in excellent health. Since this operation, he has visited Europe, and enlarged himself in the examination of Sir Astley Cooper and Mr. Abernethy, both of whom were satisfied that the whole gland was removed.

Some doubts have been expressed as to the practicability of the removal of this gland, particularly by Dr. Gibson, of Philadelphia, who insists that it is a physical impossibility; and of course he doubts the accuracy of the reports of surgeons who have claimed success in this operation, whether among themselves or the world.

The evidence, however, must be regarded as conclusive, that in some cases the entire parotid has been removed, as in Dr. McClellan's first case, already alluded to. And yet there can be little doubt that in many of the cases reported as extirpation of the parotid, only a portion of the gland has been removed, while in others the tumours extirpated, though occupying the parotid region, have not involved this gland, and these are the cases which have furnished ground for skepticism in relation to others in which there can be no rational doubt. The case of Mr. Bell, as reported in his work on Tumours, is even more than doubtful, and on this case it is that Dr. Gibson predicates his opinion, that the operation is impossible.

That tumours of the lymphatic glands, superficial to the parotid, do often fill the parotid region is now well ascertained, and in many cases, by their gradual growth and pressure, they may even obliterate the parotid gland, cause its entire absorption, and completely occupy its situation. The removal of such tumours, extending deeply behind the jaw and filling the mouth to

cality acquired by the parotid in the normal condition, may be heretofore mistaken by the surgeon for the extirpation of this gland. And, indeed, that such is the case in several of the instances reported, is manifest from the fact that the hemorrhage has been considerable, and the external carotid has not been considered in the operation; this, with other large vessels and nerves, having been obliterated by the pressure of the tumor. The thoracic anatomy, in the displacement of the parts by tumors, often throws great obscurity upon such cases. The history of the disease, its obvious consequences upon the parotid itself, and the repair in such cases retaining the locality and configuration of the gland, and suspending or disturbing its function from the beginning: all these circumstances are essential to a true diagnosis. And it is only in such examples that any surgeon can demonstrate that he has extirpated this gland, even after removing a tumor from its seat. Dr. Warren, in his work on Tumors, distinctly recognizes this distinction.

Dr. N. K. Smith, of Baltimore is of opinion that tumors composed exclusively of the parotid gland, though commencing deep behind the ramus of the jaw, do nevertheless sometimes escape from the confined situation; and as the superficial structure of the gland and its facial portion become involved and changed, the whole diseased gland protrudes, elongating the vessels and other posterior attachments, so that it finally becomes peduncled. In these cases he thinks the removal of the entire parotid is a high operation, with great facility and without danger. In such circumstances he has removed the entire thyroid gland, and found the opposite and inferior arteries so elongated by the peduncled tumor, that they have scarcely required the ligature, the gland being nearly detached from its normal attachments. Under such circumstances the operation of removing the entire parotid or thyroid gland would involve neither difficulty nor hazard.

Professor Parker, of New York, has reported in the New York Med. Gaz., for Jan. 1842, a highly interesting case of cystic tumor in the hamula of a woman, occurring during lactation. "It was of enormous size, and he punctured it with a trepan and drew off three quarts of milk. The operation was repeated twice afterward. It appeared to have originated from a closure of some of the lactiferous ducts. The same surgeon has removed two cystic tumors of enormous structure. In each case the immense size of considerable size, not situated upon the ramus of a young lady. The cysts being opened, their contents were found to be of the consistency and appearance of chalk.

Dr. Alex. E. Mack has succeeded in curing scrophulous tumors of the parotid gland by applying a ligature to the external carotid. Two of his cases, under my own observation in this city, have been entirely removed by absorption, which commenced immediately after the ligation of this artery, and rapidly progressed until every vestige of the tumors had disappeared, though they were highly distending by reason of their great size. A third case is now under treatment, the operation having been performed, and the absorption having visibly commenced.

His success would seem to encourage a preference being given to this comparatively simple operation, instead of the hazardous and formidable methods of excision or extirpation of the gland. It might with propriety be always re-

sorted to first, and time enough elapse to ascertain its effect before extirpation be attempted. See Gibson's Surgery, last edition, and New York Lancet for 1842.

Dr. Albert Goldsmith, of New York, removed the parotid gland seven years since for an enormous hypertrophy of that structure, and the disease has never returned. By keeping close to the tumor he avoided all the large vessels, and occasioned few no ligature, and the hemorrhage was inconsiderable.

Dr. W. C. Wallace, an eminent surgeon of New York, has extirpated the faciohyal gland for an enormous tumor occupying this situation, and which had attained an enormous size. The patient recovered, and this far there has been no return of the disease.

On the 29th of April, 1842, Dr. Allen removed an adipose sarcoma of a deep nature, weighing about three pounds, from the axilla of a boy named Hancock, aged two and a half years. The tumor first made its appearance two years ago, at the external axillary ring, simulating the character and locality in the region of the existence of a hernia. On rising down, the tumor was found to be situated in the walls of the scrotum, between the testes and the tunica vaginalis, and so closely connected to the cord, as high as the pillars of the external ring, as to form a groove for the spermatic. The weight loaded by the funicular, and the boy retained large well.

Dr. Mead has successfully removed the parotid gland twice; in one instance, for inclusion of this structure, being the presentation of the external carotid. The disease, however, returned in other parts of the body, and ultimately destroyed the patient. He contends in the opinion, that this gland is not very frequently the subject of disease, although occasionally found, as in this example. The lymphatic gland, situated in the parotid, is much more frequently the seat of scrophulous and other tumors. He has frequently removed this gland under such circumstances, and in two instances it had become as large as two fists. In these cases, as he found the parotid partially enveloped by the compression, so as to leave the ramus of the posterior exposed, when the tumor is removed, and he has often seen the portion of the parotid remaining in a perfectly natural state. These cases are often confounded with tumors of the parotid, and are removed successfully, when the operation is supposed to include the parotid gland. So also with tumors of the axillary glands, the removal of which is easily effected, as Dr. Mead has found in numerous instances.

In one case, he found an enlarged tumor, containing a thin fluid and being enclosed within the parotid gland; this was subjected to three or four times its size. On tearing the tumor away, he found its aspect to be perfectly normal, which led him to cut into it, when the sac presented itself in the body of the gland, surrounded by its healthy structure. This being removed, the patient readily recovered. The young surgeon should here learn, that when the structure of the gland is normal, he should cut into it instead of attempting its removal. Dr. Mead has removed the sub-maxillary gland in a patient in whom it had reached the size of the fist, and the tumor was of scrophulous hardness and elevated. In discharging tumors of the thyroid gland, he has noted that the superior thyroid artery, and several branches of the inferior, with

excised himself, and very considerably thereby followed the operation. In one of these cases the sufferings of the patient, by the enormous magnitude of the tumor, became so great, that at his urgent solicitation, Dr. Moffat was induced to excise the whole gland, after its dangers were fully explained. The operation was performed, and the patient died from secondary hemorrhage. The tumor weighed six pounds.

In Professor Gross's late work on Pathological Anatomy, vol. ii. p. 170, some account is given of a tumor of the prostate gland, which had attained an enormous size, and which seems to have consisted of a fatty degeneration of that organ. Its extirpation was successfully performed by Professor Parker, now of the College of Physicians and Surgeons, in New York, and the patient completely recovered, with the exception of the partial paralysis of the side of the face. In this case the removal of the entire prostate was necessary, involving the division of the duct of Siem, and the prostatic duct, and

requiring the ligation of the external carotid and three other arteries. The excision exposed the stylized process of the temporal bone and its muscles, and yet the wound granulated kindly, the ligatures coming away the fourth day, and the patient was discharged cured in four weeks from the date of the operation. The tumor is preserved in the museum of the College, in New York.

Professor N. B. Smith, of Baltimore, reports a highly interesting case of the successful removal of a tumor involving the prostatic gland, accompanied with cerebral symptoms, and his personal testimony to the removal of the entire prostatic gland, by Professor McClintock, of Philadelphia, in an operation of which he witnessed the performance. He also mentions the same method as due to the late Professor Davidge, of Baltimore, Professor N. Smith, of New Haven, and Professor Bailey, of Kentucky.

Dr. J. Randall also extirpated the prostate in 1838, with entire success. (See *Amer. Jour.*, for 1839.—*Edin.*)

U.

URETHRA. Before speaking of accommodations of the urethra, I will request the reader's attention to a few points of surgical anatomy, very necessary to be well understood by all who have occasion to pass instruments into this passage. From certain facts, specified by M. Malgaigne, it appears, that when the penis is lifted up, but not extended, a catheter has only to pass at most seven French inches and a half, when it will enter the bladder, and that a catheter, which is allowed to remain, will project at least as much into the bladder, if it has passed to the extent of seven French inches. (See also *Vopros. Anat. Chir.*, t. xxi. p. 234, 8vo, Paris, 1838.) The length of the prostatic portion of the urethra is variously estimated, from six to ten lines, (Malgaigne,) twelve to fifteen, (Dumas,) eight to eleven, (Ligot,) and that of the membranous, or muscular portion, from five to eight lines, (Malgaigne,) nine to ten, (Dumas,) and seven to eleven, (Ligot.) Its extent is not the same superiorly as inferiorly. Here it is very short, limited in front by the posterior extremity of the bulb, and behind by the prostate; so that superiorly its length is about an inch, and inferiorly, four or five lines. (Benjamin Phillips, *On the Urethra*, &c., p. 11.)

The spongy portion is subject to the greatest variation, and is the only part of the urethra, in which the different positions and the extension of the penis make a change. In the relaxed state of the organ, there is an angle in the spongy portion of the canal, corresponding to one of about 45°, which is effaced during an erection. reckoning from beneath the symphysis of the pubes, the two other portions of the urethra ascend obliquely backwards, so that the vertical surface of this canal is three or four lines above the level of the arch of the pubes, and one inch behind the symphysis. M. Malgaigne also states, that when a straight catheter had been introduced into the bladder of a dead subject, laid out upon a table, the instrument described, in relation to the grooved and the axis of the body, an angle of about 45°. When the penis is raised, as during an erection, the angle in the

spongy portion is effaced; but the curve in the membranous and prostatic parts remains unaffected.

The direction of the canal, when the organ is erect, has been usually compared to the letter S; and Mr. Benjamin Phillips believes, that this may be nearly correct when the bladder and rectum are distended;—but when the penis is placed against the abdomen, there is found only one curve, and this almost disappears when the bladder and rectum are undistended. If we place the penis in a direction nearly at right angles with the ideal axis of the body, and look at the urethra in that position at its course within its not bonyed the symphysis of the pubes, it will be seen that it forms a curve, which presents its convexity inferiorly; and that, after arriving in front of the pubes, the direction of the canal presents a straight line. When the corpora cavernosa are healthy, we may remove all curvature with the exception of the first. In order to attain this end, M. Amussat has recommended, that the position of the penis should be such as to form with the axis of the thigh (the patient being in the erect position) an angle of 30° to 45° (*On the Urethra*, M. Dumas, &c., p. 12.)

The urethra, then, is far from being straight; but it may be rendered so. The urethra of the urethra being soft and yielding, it is capable of being dilated to a certain degree. If its lower side then be depressed, by means of any solid instrument, the lower part of the rest of the penis, and its upper side be brought by the same instrument below the symphysis of the pubes, the angle in the spongy portion, and the curve in the rest of the canal, must both be at once obliterated. But, in order that the rest of the penis may be thus depressed M. Malgaigne observes, that his suspensory ligament, which connects it to the symphysis of the pubes and to the lower arch, must be loose;—and that, when the penis is attached higher than usual, or the symphysis descends lower, greater difficulty is experienced in rendering the urethra straight. The same thing occurs when the prostate gland is in a state of

enlargement, which carries the vesical orifice of the urethra above its natural level. This is well represented in two plates of Stanley's work on Lithotomy. In two subjects, having hypertrophy of the prostate, Mr. B. Phillips ascertained the level of the most dependent portion of the prostatic part of the urethra to be from six to seven lines and a half below the level of the vesical orifice of the canal; whereas, in healthy subjects, he found it to be only from three to five. (Op. cit., p. 18.) The spongy is the most dilatable portion of the urethra; but as any yielding of it upwards is prevented by the corpora cavernosa, between which it is lodged, the dilatation is almost entirely at the expense of its lower side, and admits of being carried to the greatest degree at the bulb, where the spongy substance is most abundant. At this point, corresponding to the almost directly oblique symphysis, the canal suddenly becomes vertical, as at the commencement of its lowermost portion. Afterwards, it enlarges again in its prostatic part, but here its floor has two lateral grooves in it, occasioned by the projection of the verumontanum in the middle. At this instance of the bulbo, there is also on the same lower side of the canal a transverse prominence, formed by the substance of the prostate gland, and a few fibres of the sphincter, which prominence is termed by M. Arnaud the *pyramide*. The upper side of the urethra being everywhere smooth and firm, presents no obstacle of this kind.

Hence it is manifest, that when the beak of a catheter is inclined against the lower side of the urethra, there are two stoppages, not mere mechanical obstructions, and met with even in the dead subject; but there are two others which exist only in the living body, and which depend upon the contraction of the sphincter vesicæ. Such, according to M. Malgaigne, is the urethra of the adult male subject. In the child, the difficulties are less; the penis is less enlarged; the symphysis of the pubes does not descend so far; the prostate is equally flat; the corpus spongiosum is but little developed; and the lower side of the urethra is, as firm, that, until the age of twelve or fifteen, scarcely any obstacle is felt in the whole course of the canal. In an old man the reverse is the case: the corpus spongiosum, which is lower, again of being depressed further towards the bulb; the prostate gland is frequently enlarged; and what M. Arnaud calls the *pyramide* more strongly marked. From all the foregoing circumstances, it follows, that, *ceteris paribus*, it is easier to insert, or pass an instrument into the bladder of a child, than an adult, and an adult, than an old person. (See J. F. Malgaigne, *Manuel de M. d'Opér.*, p. 670, vol. 3; also, Paris, 1833.) In children, however, for reasons caused by allusion to, and partly elucidated by Mr. B. Phillips, the urethra is wider except. (On the Urethra, &c., p. 10.) The male urethra being long and narrow, having above the angle and curve in it above described, and being surrounded by the prostate gland, and other parts whose diseased states are liable to interrupt the freedom of this canal, we cannot be surprised at the fact, that it is subject to more tumours, as well as far more serious diseases, than the short, capacious, and simple urethra of the female. Thus, as an able surgeon remarks, "a mechanical obstruction to the flow of urine through the male urethra may arise in various ways. There may be an enlargement of the

prostate gland, by which one extremity of the urethra is expanded; or always in the perineum; or one of the mucous follicles may be inflamed, and converted into a solid tumour; and any one of these, as well as many other causes, may operate so as to produce the effect. The most common cause of difficult insertion, however, is a contraction of structure of the urethra itself." (See Benj. Brodie, *On Dis. of the Urinary Organs*, p. 2, vol. 2.)

Mr. Benjamin Phillips does not concur in the opinion that the membranous portion of the urethra is the most frequent seat of false passages, and he maintains that it possesses much solidity. "False passages (he observes) are less frequent here, than in the bulbous portion of the canal. (See also Velpeau, *Med. Opér.*, t. iii., p. 386.) The reason of this must be immediately evident: false passages are readily made in consequence of the difficulty experienced in the entrance to pass an instrument through the strictured portion of the tube. Stricture is most frequently seated at the point of junction between the bulbous and membranous portions of the canal; consequently the false passages will be usually anterior to this latter point." (On the Urethra, &c. *loc. cit.*, p. 10. See also Velpeau, *loc. cit.*, p. 310.) "Thus it is obvious that a narrow, a not deep, an oblique, and an anterior, or an oblique in direction, and its perforation indications."

In the articles CATHETER, and URETHRA, RESECTION, &c., I have noticed the advice of Sir Benjamin Brodie, and of M. Velpeau, to keep the back of the catheter, stiff, or rigid, against the upper side of the urethra. "This side of the urethra, forming the concave margin of the segment of a circle, lies in this very aspect, glides then the other, and less disposed to wrinkle. Having no recreation, and being closely adherent to the lower surface of the penis, it presents in its spongy part great regularity, and is so strong as not to be in danger of injury from the catheter." There is, however, as M. Velpeau explains, a small portion of the upper side of the urethra almost naked, just in front of the symphysis, where the corpora cavernosa diverge from the bulb to be inserted into the rank of the scrotum and os penis; and when the beak of the instrument, if carelessly pushed on, may do mischief. (See Velpeau, *Med. Opér.*, t. iii., p. 387.)

This subject has not been overlooked by Mr. Benjamin Phillips. "In introducing an instrument into the urethra or bladder, (says he,) it is necessary to recollect, that the two opposite portions of the urethra—the superior and inferior—differ singularly as to their conformation, and that we cannot indifferently follow the one or the other with the beak of an instrument. The inferior portion is yielding; the superior along the penis not at the height of the scrotum, are beneath the pubic symphysis, is supported by nothing solid. In sliding along the canal, the beak of the sound may easily push down the lining membrane of the urethra; or, sliding its surface, we meet at intervals with injections of the membrane, resulting from its flatness, which occasionally have a tendency to arrest the progress of the instrument. Some richness of mucous follicles, and, among others, those of the glands of Cowper, are, according to general opinion, susceptible of recurring and arresting the beak of a sound, especially if it be of a small size." Lastly, at the level of the bulb, and in front of the entrance of the neck of the blad-

der, on the sides of the verumontanum, these exist on the inferior surface marked depressions, the sides of which are directed towards the external orifice of the urethra; against these the back of the sound passes, and by them is occasionally prevented from making further progress.

"If we examine by means of dissecting (artificially made) false passages formed in the urethra during life, or after death, in subjects labouring of catarrhus, we find, that they are produced by the rupture of the inferior crypts of this canal, and that the greater number of these passages exist either at the situation of the depression I have pointed out, or at the bulb. The disposition of the superior part of the urethra is infinitely more favourable, as a conductor for instruments, than the inferior. Sustained in front by the corpus cavernosum, and behind by the pubic symphysis, it presents great firmness; and we find only logarithmic dilatations, which are removed by the dissection produced by the instrument; and no obstacle is here presented to its progress. No depression exists here under ordinary circumstances. There is no projection of the prostate into this portion of the tube; neither do we find many folds, either isolated or grouped; nor any considerable callosities." (On the Urethra, &c. p. 129.) For additional remarks, see CATARRH, and URETHRITIS, &c.—C.

[Dr. Alex. E. Bosack, of New York, has called the attention of the profession to a peculiar affection of the female urethra, consisting of small tumours of a solid red colour situated within the urethra, and covered by the delicate lining membrane of the urethra, and demanding surgery for their relief. He describes them as exquisitely sensitive, and bleeding upon the slightest touch.]

They resemble a split pea, varying from that to the size of a small kidney bean, and are placed upright in such a manner as to break the flow of urine. The patient does not complain of the pain of urinating at her greatest distress, for it is not to be compared to that caused by exertion, or from contact of the dress, which is frequently excruciating.

These tumours are attached usually to the margin of the urethra, from which they can be readily snipped off with the scissors; they are pale, however, to return, and the margin of the urethra assumes a fungoid appearance, with the same highly organized structure. In some instances it appeared as if the lining membrane had shot out like a fungus, or was pedicled, under which circumstances the doctor is in the habit of excising a portion of the urethra, say from half an inch to an inch from the external orifice.

The steps of the operation consist in first measuring the length of the urethra by the introduction of a slender catheter, and making it the instant the urine begins to flow, the finger-experience is then imposed with the point of Mucous and drawn out.

The urethra is next circumcised with a knife, carrying on the dissection until you arrive at sound structure, when you make a transverse section of the whole. The hæmorrhage at this moment is excessive, but by pressure it is always arrested. The patient is usually troubled with retention of urine, making it necessary to have the water drawn off. This inconvenience may be obviated by leaving up a catheter in the

bladder for the first day or two after the operation.

This disease is spoken of by Morgagni in 1761, afterwards by Mr. Hughes, in Gloucestershire, in 1769, and also by Mr. Wardrop in the London Lancet, vol. 12; by Boyer in his Surgery, Sharp, Winslow, and Astuc's Chancery, and Dubois, Malacou du Châpelle, Rosenmüller, Vogel, Kuhlbrandt, and Præschke.

Dr. A. E. Bosack arrives at the following conclusions respecting this disease:—

First, that the disease is characterized by peculiar symptoms. Second, that it is not confined to any age. Third, that it is unaccompanied with discharge, and the parts are found to be normal. Fourth, that in order to prevent a return of the disease it is better to remove at once the external portion of the urethra, including the tumour. Fifth, that it is a complaint of slow growth, and does not attain to any great size, for in six instances, yet recorded, we find it not enlarged to more, but it been found larger than a small cherry.

Dr. Parker, of New York, has lately performed the operation of excising these tumours from the female urethra with success.—*Remedy.*

URETHROPLASTIC. The application of the autoplasmic method to the cure of fistula, fœces, and ruptures of the urethra, has been successfully made by Drs. Blott, Maitre, Demoult, Mucifin, Bancelin, and many other American surgeons.—*Remedy.*

URINARY CALCULI. A highly interesting case has lately fallen under my own observation, in which several of a kindred calculi have passed at different periods, through the urethra, varying in size from that of the head of a pin to that of a large sized grain of coffee. Seventy-three of these calculi are now in my possession; and as the patients under my personal observation, and more are passing every week, I can vouch for the facts here recorded, and shall report to the profession the progress and the result of the case in one of our periodicals.

The colour of these calculi is a yellowish brown, very smooth on their surface, and for the most part have a convexity on one side, and a concavity on the other; which, with some gain, may be accurately fitted one to the other, in the same order and relation in which they may be supposed to lie when in situ.

These calculi resemble very much those little concretions which are so often discharged from the bladder, and are little to be mistaken for these. On analysis, however, they are found to contain only phosphoric lime, without a particle of uric acid or ammonia. The valuable paper of Dr. Williams, in the *Philosophical Transactions* for 1827, has been, or with this test, by which to distinguish the calculi of the prostate gland from those of the bladder and kidneys; and by this and other criteria, there can be little doubt but the conclusion is the same here exhibited in the present case; whereas, so fast as they are discharged, they get back into the bladder, or forward into the urethra; and then pass off with the urine.

The history of this case is highly important, and from the patient I collect the following facts:—He had been of a hale, vigorous constitution, without any symptoms of this affection, until about four years since, when he was 64 years of age. He was then attacked suddenly by a suppression of urine; frequent supplication, but no ability, to empty the bladder; pain in

exhausting, as to disable him from his work and even walking. He at last resorted to Hahnemann, and by the advice of his physician, took medicaments of various kinds made of rhubarb; the disease being supposed to have originated from the young water treatment used. Soon after this excruciating tertoid came on, while expecting aid to a great extent, with the hope of finding relief by this means, he observed for the first time, that whenever the urine flowed, small calcareous concretions of a yellowish colour, of the shape and size of rufous seeds, passed through the urethra, having collected a tea-spoonful of these little stones, he submitted them to a physician for examination; for when he was sent to a distinguished surgeon at this city, that he might oblige the operation of cauterizing. The wound having been introduced, and the presence of calculi having been detected, he was told that the operation of lithotomy could alone afford him any relief.

From his advanced age, he declined to submit to the operation, and gave himself up to a lingering death. As, however, no relief was obtained from the diuretics or diaphoretics which he had been so long using, and as he began to feel that the gut was doing positive injury, he resolved to discontinue the use of them all, and began to drink pump-water, from which he had been deprived by medical advice, and then, as he expresses it, "lived in the land for him or death."

In about three weeks from this time in which he thus gave up all medical treatment and drank freely of cold pump-water, he observed a small stone to drop into the urine, and in a few days another; each affording him some relief. Since that time, which is now a little more than eighteen months, he has passed all these, and many more which have not been preserved. He says that one passes every four or five days, and sometimes two at once, and he is conscious of the passage of each, although the pain is very slight. Since these calculi have been passing, he has been rapidly becoming his health and bodily strength; and from a spectacle of emaciation, he is now a strong, robust man, and at his age has extraordinary health. He has no difficulty in passing his urine, except some times when a momentary interruption occurs to the stream, by one of the stones passing into the urethra; when it is soon forced out with very little inconvenience.

He is impressed with the belief that there are fragments of a large calculus in his bladder, which was felt by the surgeon, and that since he ceased to trust in lithotomy, it has been continuously broken, and that he is now compensated by supernatural agency. He is perfectly happy under his condition; and the prospect of dissolving his first fine view of the subject, or convincing him that natural causes will account for the comfort he enjoys, is exceedingly questionable.

But while we leave the patient himself undisturbed in the enjoyment of his health, the medical philosopher cannot fail to despair in the progress of this case, as portrayed by the patient, and in the results of which he is now so glibly given, details preserving more most important and interesting features, which may be improved for practical purposes.

That these calcareous deposits have never been larger than they now are is clear from the smooth surface, and from their peculiar organi-

zation. That they did not originate in the bladder or kidneys may be deduced from the fact already named, that they do not contain an atom of the lithic acid. And that they consist at all in the bladder in this quantity, any length of time is impossible, from the fact that so soon as one of them gets into the bladder, it produces uneasiness, and it is dislodged, when the relief seems to be entire.

The probability is, that when he was visited by the surgeon, one or more of these calculi had passed into the bladder from the prostate gland, in which they were imbedded, either in the enlarged cells of the gland, or coagulated, as they are sometimes found. There were but a few, the number being the most probable, therefore, they passed one or two at a time into the bladder, and so on through the urethra.

Had this patient submitted to the operation of lithotomy, and the calculi been removed, it could be readily perceived that no permanent urinary secretion would have been obtained, as to remove them from the body of the prostate is altogether impracticable. It is highly probable, therefore, that his refusal to submit to lithotomy has saved his life, although any opinion would be liable to give the same opinion under similar circumstances. May we not surely presume, that many of the failures occurring in lithotomy occur under similar circumstances, the calculi originating in the prostate, and thence finding their way perpetually into the bladder?

In Marcet's valuable *Essay on Calculus Vesicæ*, much information on this subject will be found, together with a plate very accurately representing these calculi of the prostate gland. He states, that the symptoms are also marked for stone in the bladder; and if any of these calculi be discharged, their appearance is so similar to that of lithic concretions, that unless their chemical nature be ascertained, they will almost infallibly be mistaken for the species of calculus. He also presents an instance of a surgeon of the opposite kind, in the case of a young minister, who, while attended by one of the most eminent surgeons in London, passed a number of small brownish concretions, which were mistaken for calculi of the prostate, and the treatment was for some time instituted on that supposition. But upon subjecting these calculi to chemical analysis, he found them to consist of pure lithic acid; and upon an appropriate treatment being adopted, the symptoms were entirely disappeared.

Another form this affection, and requiring different treatment, a case may be mentioned which often occurs, in which the calculus, although formed in the kidney or bladder, becomes lodged in the prostate, in attempting to pass through the urethra. Sir Astley Cooper has recorded a case of this description, in which, upon attempting to introduce the catheter, he felt a grating sensation at the neck of the bladder; and so inclosing the finger into the rectum, calculi could be felt moving in a spot within the prostate, and sometimes passing could be heard as their surfaces were pressed together. It was proposed that a small incision should be made through the rectum into the prostate, for the purpose of extracting the calculus; but the patient would not consent. This gentleman died a few days after, and a few days after was found to contain a number of calculi; and this was the case with his kidneys, from which these came

existence had sometimes threatened, and were treated in their course.

Dr. W. Cutler, of Philadelphia, has a statistical account of cases in the Pennsylvania Hospital, in the *Amer. Journ. for 1828*, which is valuable and well to be referred to.

Professor Gibson has a valuable chapter on this subject in his late work. He mentions a singular variety of calculus found under the bladder by Dr. Physick, and since by Dr. Leakey, of Washington county, Pennsylvania. It closely resembled common plastering mortar, and consisted of both scales of calcareous matter and hair. In his own practice, Dr. G. removed a large stone by lithotomy from a boy four years old, in the centre of which was found the greater part of a needle, which had secured the nucleus for a calculus, which had only last assumed the gloss of a small stone.

The case of the late Chief Justice Marshall, upon whom Dr. Physick performed the lithotomy operation of lithotomy a few years ago, is in our respect unique, viz., the number of calculi found in the bladder, which he exceeded that ever before reported. The most remarkable fact on record is that in which six calculi were found in the bladder after death, but Dr. Physick extracted from the bladder of Chief Justice Marshall more than one thousand, varying from the size of a partridge shot to that of a bean, which were created, besides many which were lost. They were uniformly of an oval shape, and upon the end of each was a thick spot of the size of a pin's head. Notwithstanding the frequent introduction of the forceps and scoop, as well as the other precautions for completely draining the bladder, the venerable patient, who was of very advanced age, completely recovered, and for a number of years remained upon the bench he had so long honored in excellent health.

Dr. Sewall, of Washington, has recorded, in the *Boston Medical and Surgical Journal*, an extraordinary case of hemiparalytic calculus.

For the treatment of urinary calculi, Dr. Physick was in the practice of using the extract of hyalassac, (pisciberry,) in doses of a dessert-spoonful three times a day, with or without ten or fifteen drops of opium or turpentine. The Venice turpentine made into pills, to the extent of half a drachm in 24 hours, is recommended by Dr. Bevan, of Germantown. These and the like remedies are useful when the patient is suffering from a fit of the gravel, or in anticipation of its recurrence, and which for the most part is dependent on the passage of a calculus along the ureter.—*RATER.*

UTERUS, CANCER OF. The disease gradually first attacks the cervix, and especially the posterior lip or margin of the os uteri. In the beginning, the symptoms are attended with ambiguity, and cannot be discriminated with any degree of certainty from those arising from various other causes productive of irritation of the womb. Most frequently the disease is ushered in by irregularity of menstruation, a profuse bloody discharge, or a profuse leucorrhœa; together with an annoying sensation of tension, weight, and dragging pain in the lumbar and hypogastric regions, extending frequently to different points of the pelvis and high femoral bones to make water, urination; and finally, a burning pain in the cervix uteri. On examination, the portion of it towards the vagina is perceived to be either hardened on every point, or indurated in some places, and softened in

others. The os uteri is likewise indented, irregular, and half open. When pressure is made with the finger, a sanguine bloody matter is discharged.

The disease may continue in this state for several months, or even years; but, at length, the symptoms become aggravated; the dragging pains, which now affect not the groin and thigh, occur with increased violence; and the discharge becomes exceedingly fetid and red, mingled with bloody matter and clotted blood. Sometimes, as I have frequently noticed, profuse hemorrhages occur. At the same time, the constitutional impairment becomes more and more serious, and is accompanied by the anorexia, hectic, and the pallid sallow appearance of the countenance, so characteristic of organic disease. Ultimately death takes place, either suddenly, from profuse bleeding, or, as more usually happens, the patient dies hectic, in a state of hectic suffering.

If, in this advanced form of the disease, a post mortem examination is instituted, the portion of the uterus connected with the vagina is found enlarged, or more or less destroyed, and thick, or diffused masses, extend from this point within the cervix. The tumor, in upper portion of the vagina, is frequently much hardened; and the attention may even be attracted to the os uteri and bladder, so as to form new connections between one or even both these viscera and the vagina, and account for the involuntary discharge of urine and feces by the latter passage.

When the disease commences in the cavity of the cervix, the cervix remains for a long while unaffected, while the body of the womb enlarges in every direction, and may attain considerable magnitude. In such a case, the swelling is sometimes distinctly perceptible through the paries of the hypogastrium.

Cancer of the uterus may originate at any period after puberty, (Ciculus, *Bartholin's Chor.*, l. ii. c. 680.) but the time of life between the ages of 40 and 50, is that in which its commencement is most common. I have attended not less than three women, who died, relative to the age of 20; than the effects of the cancer of the womb. Cruveilhier observes, that from the age of 25 to that of 50 is the principal season for this cruel disease, though he has known one woman of the teens die of it, whose age was only 30; and has seen it in women as old as 80, 70, 60, and even 55. In University College Hospital, I lately had a case in a woman about 70, in whom it proved fatal about two years after its first detection. In this case, the disease had impeded the whole of the vagina and even the labia. The young woman, whom I attended in Great Ormond Street, for a cancerous womb, of which she died, had an aged mother, who had suffered severely from carcinoma of each breast; but had latterly been freed from the disease by a sloughing process, an event which is uncommon, but does now and then happen. (See *Cancer*.) Next to cancer of the breast, cancer of the womb is the form in which the disease most frequently presents itself. Sometimes the disease takes place in the womb and breast together; and Cruveilhier records an instance in which cancer was accompanied by a medullary tumour in the substance of the left hemisphere of the brain, so that, in the latter stages of the case, the patient was attacked

with osseous and hemiplegic. According to this distinguished pathological, however, notwithstanding the tendency of cancerous disease in general to affect the whole economy, by extending from the point first attacked, as from a centre, cancer of the womb is but rarely accompanied by this general implication of the system, and especially of the brain.

It appears also, from Cruveilhier's researches, that the vagina is as frequently the seat of cancer as the neck of the womb. "In anterior pages it is much more frequently attacked than its posterior; and hence it is rare to find instances in which the lower portion of the bladder does not participate in the disease." (*Ann. Pathol.*, iv. xiii, p. 6.)

Cruveilhier feels, that what he terms the smaller polycancerous cancer, is the most frequent of all the forms of cancer in which the uterus is liable. In this the uterus is transformed into a spongy texture, from which a cancerous substance, of gelid or fleshy consistence, may be compressed in the shape of small worms; so that, when this texture has been crushed by suitable preparation, a hollow cellular structure remains. Cruveilhier conceives, that he has made out the fact, that cancer of the uterus begins in the venous system. However this may be, he notices another fact, which is of greater importance to the practitioner, viz., that the lymphatic glands in the pelvis are almost constantly affected in cancer of the womb. He specifies in particular two, situated, one on the right and the other to the left, on the sides of the pelvis, on a level with the highest part of the ischio-anal foramen; these, he says, are often the only lymphatic glands implicated. The lumbar glands he finds less frequently diseased than the pelvic; and he states, that they may be enlarged and red without presenting any vestige of cancerous structure. "The uterine glands are only involved when the disease attacks the external uterus, and the orifice of the vagina. In only one dissection he found the cancerous substance in the thoracic duct, though he examined it at every opportunity; and, in another instance, he traced the same substance in many of the lymphatics, which proceeded from the diseased parts." (*Op. cit.*, iv. xviii.) In one case, described by Cruveilhier, one ovary was enormously dilated, and the corresponding kidney wasted. "The relationship the uterus with the lateral and superior part of the vagina, and with the lower part of the bladder, which is often implicated in cancer of the uterus, account for the impellment to the flow of the urine through the ureters, the lower portions of which are often surrounded by cancerous masses, which compress them. This compression may take place in so great a degree, that the lower part of the ureter is completely obliterated, and, what is remarkable, such compression does not produce the fatal consequences which theoretically might be expected. The urine dilates the ureter, (*vide* *loc. cit.*, p. 2, dg. 2.) which, at the same time that it becomes dilated, is lengthened and rendered tortuous or spiral, like a varicose vein. The pelvis and calices in their turn are also expanded, so as to acquire a considerable capacity. The kidney, compressed by the urine, notwithstanding in the dilated calices, gradually wastes away, and is converted into a mere shell, or husk of a pale yellow, having some resemblance in colour to the changed state of the kidney, known of late by the name of Bright's dis-

ease; and such atrophy may proceed so far that no urine can be secreted, or so little, that any sedulity may be easily prevented by absorption." The possibility of life continuing long, with an obstruction of both ureters, would be, however, a very different case from that described by Cruveilhier.

Gangrene, consequent to cancer of the womb, as found by Cruveilhier to be very common, sometimes destroying the cancerous structure, layer by layer, and, in other instances, attacking the whole mass of it. In both cases, the discharge becomes horribly fetid, and when the finger is withdrawn from the vagina, it brings away a bloody purid secretion, which Cruveilhier says can be compared to nothing more like it than the putrescence into which hospital gangrene transforms the textures invaded by it. This discharging may advance slowly or rapidly, a difference which has vast influence on the intensity and symptoms of the symptoms. When gangrene attacks the whole of the cancerous mass, and nearly annihilates it, the case might be mistaken for one of primary mortification; and in many examples, the cancerous state of the pelvic and lumbar absorbent glands is the only criterion of the gangrene having been produced by a cancerous affection of the uterus. (*Cruveilhier, Ann. Pathol.*, iv. xxv.)

As I have never seen more than palliative relief derived from medicines as local applications, in the treatment of true cancer of the womb, I shall need well long upon this part of the subject. So far as my experience goes, temporary relief is to be sought principally in the judicious employment of narcotics and purgatives as necessary requires, the hygienic position, rest in the hypogastric region in the early stage, isomentation, and frequent solution with tepid water, or decoction of poppies. I have not generally found the chloride of soda useful, nor any astringent injection, superior to cold water in the temporary relief afforded; but when the discharge is copious and exceedingly fetid, they may be tried. The tincture of iodine, the hydropic acid of potash, the tincture of mercury, the carbonate of iron, the liquor arsenicalis, the aqua haemorrhoidalis, and almost all the medicines specified in the article Cancer, I have examined, but without any permanent benefit.

Modern experience proves, however, that when cancer is rather extensive, is confined to the neck of the uterus, it will sometimes admit of being successfully removed by excision. The cervix uteri, in the healthy state, projects from three to six lines into the vagina; but M. Lisfranc has known it make no projection at all. The vagina around it is thin, and in contact, on one side, with the bladder, and, on the other, with the rectum; while upwards it is continuous with the proper substance of the uterus. The vagina may be detached from the cervix uteri to the extent of more than half an inch, without any risk of opening the callosities of the perineum which separates it from the bladder; but since the latter is now adhered very intimately to its anterior surface, it might then be reached by the instrument. Behind, the perineum not only covers the corresponding surface of the uterus, but also descends over the vagina, to form what M. Vrieseu terms the perineal excavation; so that, on this side, the knife, if carried with a softness, would meet the perineum. M. Vrieseu considers it erroneous then to say that there is a space of eight lines in

might be supposed that the operation just described must necessarily be of an extremely painful nature, and that troublesome hemorrhage would always occur. But no such consequences usually ensue; the drawing down of the organ being commonly effected by very slight efforts; and, as to pain, the patients hardly ever appear to experience any. The bleeding seldom exceeds one or two ounces. There is one consequence, however, which usually follows, and which, I need scarcely observe, requires to be extrinsically treated; I mean inflammation of the peritonæum. Whether this arises from the division of the portion of that membrane descending between the rectum and uterus, or from continuous sympathy, (as Hunter calls it,) or from an extension of the disease from the gynecymatous substance to the membrane covering of the uterus, is not easy to determine. The portion of the cervix removed is usually that which projects into the vagina, and so more; and it will, I imagine, be conceded, that when we consider the general extensibility of the organ, such a portion of it may be safely excised without impairing the important membrane in question; but I do not say that, on occasions where a portion of the body has been removed with the cervix, such an injury may not have been done; an operation which the practitioner should do his utmost to avoid." (See Dr. J. Brown's paper in *Edin. Journ. of Med. Science*, vol. vi. p. 21-27.)

In 1828, M. Lachapè had performed this operation on thirty-six individuals, as is stated, for cancer uteri, the recognition of which last declaration as a positive fact, I beg to observe, is a matter of great importance in determining the merits of the operation. Of the thirty-six patients thus operated upon, "thirty were then well, three dead, and three in progress of recovery. One female, operated on some years before, had since become pregnant, and recently given birth to twins. Lastly, at the Hôtel-Dieu, the entire uterus has been removed by M. Roux; and, in September last, this formidable operation was performed at La Charité, by M. Roux. The patient died in twenty-four hours after the operation." (See *Practical Proprietary of the Parisian Hospitals*, by P. S. Kæmper, p. 17.) Langerbeck's excision of the whole uterus, by cutting through nearly the whole of the ligament, I do not deem it necessary to detail, as it is a proceeding which I would never recommend to be imitated. The poor woman experienced the same fate as the patient of M. Roux.

Even with regard to the excision of the cervix uteri, it is perfectly manifest to me that many of the cases in which it was performed were not truly cancerous. Doubts may be entertained, I think, whether the enormous tumour reported in the very first instance of such operation by Hunter, was really a cancerous affection. Several of the cases operated upon in Paris, were decidedly not of this character. On this point I fully agree with Dr. Brown, an eye-witness, who remarks: "While I admit the facility with which such a measure may be accomplished, I must be permitted to doubt its necessity in some of the cases related. The second and third were, in my opinion, such affections as would have yielded to common local and constitutional measures, and would, I have to doubt, have been so treated by British surgeons, and perhaps by a few of our French brethren." (See Brown, in *Edin. Journ. of Med. Science*, vol. vi. p. 29; and M.

Recond's *Obi. upon Ovar. of the Cervix Uteri*, in *Journ. Robinsonianæ*.) M. Velpeau, who regards the excision of the cervix uteri as an operation so completely established as to render unnecessary any reply to the arguments used against its performance by Wood and Zang, acknowledges that the difficult point is to lay down precisely the indication for it. "The elevation from simple hypertrophy of the neck, being rather an infirmity than a disease, never requires it. Extrusions, ulcers, syphilitic growths, not being of an incurable nature, are none of them cases for it. The same may be said with respect to the inflammation and lumps free from pain, whether attended or not by chronic inflammation, so often met with in females between the ages of thirty and forty. It is only, then, in well-marked cancerous disease, that the operation is allowable; but here is the difficulty of the question. In truth, so long as cancers live from absorption, or does not present itself in the upper part of the vagina, in the form of a mass or less located mass, the diagnosis is exceedingly difficult. The intensity, or natural consistency of the cervix, the variations in its size, postures, and density, and form, according to the age and different conditions in which the female may be, demand, in the first instance, great ability, in order to prevent the belief in affections of which not a vestige exists. Then, how can there be any certainty of a lesion so deeply situated in the midst of so condensed a texture, and composed of elements so changeable? This is not all: when the symptoms of cancer is inconstant, its limits must still be ascertained. On this point, details are seldom quite removed, till the disease is far advanced; and scarcely ever can a guarantee be given that the cervix is the only part diseased, and the body of the uterus not yet attacked." However, encouraged by the fact, that the cancer of the uterus sometimes hangs about the neck of the system, M. Velpeau would absolutely renounce the operation. "It is better," says he, "to try it than abandon the woman to a certain death, whenever the disease leaves a hope that the whole of it may be removed." (See *Nouv. Elem. de Méd. Opér.*, t. iii. p. 616.)

In one instance, Dr. Brown, in the attempt to remove the cervix uteri, tried to draw down the latter part: "For this purpose," says he, "Bainson's speculum having been introduced, its blades were dilated and held by an assistant; the hooked forceps were then passed through the tube, and fixed on each side of the cervix. Gentle traction was then exercised (the speculum having been withdrawn) upon the two forceps, which seemed to produce more weakness than is usual, till a considerable portion of the circumference appeared within the blades. It was now found that the 'excrecence' had been torn off from the cervix, and remained attached only by a portion of the lining membrane: this was divided by a blunt bistoury passed cautiously on the finger, and the tumour removed. Attempts were now made to fix the hooks into the lower part of the uterus, in order to remove the diseased surface from which the new growth had originated; but the instruments uniformly separated from the parts being unusually soft. One of the forceps was at length passed into the os uteri, with a view to fix it there, when a discharge of thick pus, to the amount of about one ounce, flowed; and, on passing up the finger, the ante-

tion of the uterus appeared so ineffectual, (throughout of every kind,) that further attempts to excise the cervix were considered inadvisable. The vagina was therefore washed out with cold water, and cold compresses applied; about two ounces of blood were lost. The uterus did not appear much enlarged. The woman recovered, and became free from all her previous ailments. The narrative deduced from this case by Dr. Keeney, and I. W. That it may not be all ways justifiable to excise the cervix uteri, or even to draw it down in that position. 2. That uterine or the uterine cavity may exist as a distinct entity, without any decisive symptom to denote its presence. 3. That very great relief, almost amounting to a cure, may be afforded by the evacuation of such purulent discharges." (*Op. cit. vol. 11, p. 27.*) The original disease appears to Dr. Brown to have been chronic inflammation of the cervix, leading to the formation of pus within the cavity of the uterus, and accidentally complicated by the existence of a small exostosis. The absence of hardness and lancinating pain, he says, defines that it was not cancer. The whole history of this case and its conclusion thus show, and of course the case is another example of which, the excision of the cervix uteri was not necessary.

Instead of the excision of the cervix uteri for cancerous disease, M. Bayle advocated the application of caustic; and his advice was justified upon the fact shown by pathological anatomy, that, in the early stage of malignant ulceration of this part, the texture of the uterus is healthy at the distance of two or three lines from the ulcerated surface. The patient having been placed in the right position, and the speculum introduced, the cancer is to be cleared with doses of caustic, introduced by means of a long pair of forceps. If the surface is irregular, or the seat of fungous granulations, they are to be removed with curved scissors, or a sharp edged kind of scoop, (Duguesne.) In this manner, indeed, such growths may be removed, not only from the cervix, but from the interior of the uterus. After the ulcer has been cleared, a roll of caustic is placed below the speculum, in order to protect the vagina from the action of the caustic. Then the caustic is applied, either the arsenical paste, (Bayle,) or the pure potash, scraped to a point, and fixed in a pinto-crayon; or the acid nitrate of mercury, with which lint is soaked and conveyed with forceps to the ulcer. The application is continued for one minute; then copious injections of tepid water are employed for the removal of the absorbed particles of caustic; the caustic and speculum are withdrawn, and the patient put into a warm bath. In about four or six days, the application is to be repeated; and, if no ill consequences follow, it is to be continued at short intervals, ten more and more lightly each time as the proportion as the cure advances. (*Lancet*; also *Malpighi*, *38th of Med.*, p. 745, ed. 2.)—C.

UTERUS, POLYPUS OF. The fact alluded to by Cooper, that polypus uteri has not the same tendency to return, when partially extirpated, that polypus nasi has; is fact, that partial extirpation, whether by the knife or ligature, is always followed by death of the portion remaining attached to the uterus, in very well

illustrated by a preparation in the Obstetrical Museum of the College of Physicians and Surgeons, New York. The tumor was removed from the uterus of a lady, who had for three years suffered with the symptoms of polypus. The ligature was applied by Dr. Deland, late Professor of Obstetrics in this college. The second day after the operation, on attempting to tighten the ligature, it broke, and the cancer came away. Seven days after this the tumor was seized with a pair of strong lithotomy forceps, and, after slight resistance, was brought away. On examination, it was discovered that the tumor had not parted at the point where the ligature was applied, but that it had pulled off from the uterine mucous membrane about an inch higher up. The preparation now presents the body of the tumor, the neck distinguished by the application of the ligature, and above, an expansion terminated by a smooth surface, about the size of an acetabulum, where the polypus was attached to the vaginal cervix. This fact suggests the probability, that polypus of the uterus, like those of the bladder, may at first be formed of detached cords, which afterwards becoming organized, unite to the uterine parietes by simple adhesion. This hypothesis will account for the fact of their destruction by ligature upon any part of their structure, and their subsequent separation from the uterine wall, and coming away entire.

Professor Francis, of New York, adheres to an opinion similar to that of Professor Cooper, and is strengthened in this belief, from facts associated with a case of polypus at the fundus, which having been partially removed, pregnancy occurred subsequently, and to an issue followed. There is no evidence of polypus at present existing, and the uterine functions are sustained with their wonted regularity.

Anglican experience, according to Dr. Francis, of New York, justifies the use of iodine, both internally and externally, in a large class of uterine affections. No remedy, according to Dr. Francis, exists a more general and salutary influence on the great vices of the female economy. In cases of sterility or barrenness, its impotence has been demonstrated in many instances; irregularities, arising from difficult menstruation, and the non-appearance of the monthly hæmen, have been overcome; in short, the hydroiodate of potash, among other forms of iodine, is ever to be kept in mind in various recent cases of this nature. See also Francis's third edition of *Dequain's Midwifery*.—Bast.

OVULA. The excision of the ovula, as a part of it, when elongated, is often necessary in cases of obstruc-tion. It can often be accomplished with the scissors, but Dr. Physick conducted an instrument for introducing the ovula, on the same principle as that which he subsequently applied for excising the testis. The removal of the ovula has often been performed for spawning, when the ingredient is admitted to a narrowness of the passage, from the glans to the mouth, and in such cases the testis are often excised. Dr. Physick's paper on the subject is in the *Amer. Journal*, for 1827. Everard, both of the ovula and testis, has long been known to be useful in certain cases of sterility. Mr. Brax, a surgeon, of Manchester, has divided also the frenum epiglottidis.—Raman.]

V.

[VAGINA. Dr. Mayo, of Cincinnati, has three successful, by dissection, in separating the walls of the vagina, which had adhered throughout their entire length. In each case, the admission was of four years standing.—*Watts.*]

VARICOCELE. In this disease may be felt, in the course of the spermatic cord, an irregular swelling, consisting of several enlarged vessels, which swelling has a pyramidal shape, with the broad part towards the testicle, and the narrow part towards the abdominal ring. When the patient lies on his back, the tumour diminishes, or disappears altogether, because this position promotes the return of the venous blood; but when the patient stands up it reappears, because the column of blood in the spermatic vein has then to meet against its gravity. Moderate pressure with the hand will make the tumour disappear, not all at once, but gradually; and, when the pressure is taken away, the swelling reappears, not suddenly, but in a slow and gradual manner.

The spermatic veins, (M. Velpéux observes,) which are tortuous, anastomosing, very large, and to the number of two, three, four, or even more, are readily distinguishable from the epididymis, and usually placed in front and at the sides of the other vessels. Long, soft, distensible of valves, continually dragged by the weight of the testicle, enveloped in loose cellular tissue, exposed to compression in the normal canal in consequence of the double bend which they make, and being also equally pressed upon in the sheath in front of the tunicle, by the end of the ileum, or its caecum, on the right, and by the sigmoid flexure of the colon on the left, it is not surprising that the spermatic veins should frequently be the seat of varicose dilatation, and that a varicocele should become sometimes very large. The kind of loosely chain, which they then form, gradually enlarges as they approach the testicle, because their branches increase in number in proportion as they come nearer to the lower end of the cord. This fact proves, that in order to cure them by section or ligature, it is essentially practised, (*Prof. Agric. Sprengel, t. vi.*) and in modern times successfully by Dieffenbach, they should be exposed as high as possible. (*See Alf. Wilson, Ann. Chir., p. 190, L. E. Rev. Paris, 1838.*)

Mr. Mayo joins J. L. Petit, Cullen, and Richerand, holding that it is more frequent on the left side than the right, "owing to the peculiarities of the sigmoid flexure of the colon over the left spermatic vein. But the same reason (he adds) it is often benefited by paring" (*Quæst. of Human Pathology, p. 382.*) M. Blandin also specifies, as one cause of varicocele, the pressure of the large intestine on the spermatic vein. (*See Dict. de Méd. & de Chir. Pratic., vol. xv. p. 212.*) The indurateness of the spermatic veins having no effect, a large corpus, and not testicle coats, and the blood in them having no effect against its own weight in the erect posture of the body, must all give a tendency to a varicose affluence of its lower branches. It is sometimes alleged, that even in persons who are not habitually colicky, the left spermatic veins are naturally more tortuous and

capacious than the right. Cruveilhier also takes into the account the generally larger size and lower situation of the left testis, as possibly concurring. (*Monat., vol. iii., p. 564.*) Persons who ride much are very liable in the disease, and so are residents in warm climates.

In general, nothing more is required than the suspensory bandage, cold applications, poultices, and sometimes leeches, to remove any temporary inflammation or pain resulting from varicocele; and then the disease remains stationary, the patient merely wearing the suspensory bandage, without which the scrotum usually soon returns. Patients with varicocele should also have attention to cold bathing, and avoid coitiveness, which precautions, if not adequate to effect a radical cure, will generally keep the disease from making progress and becoming troublesome.

Couch and other writers relate cases, in which the pain was so intolerable and insupportable, that castration was the only means of relief. Putting castration out of the question, let us briefly inquire what expedients have been tried when the disease is productive of unusually severe pain, and resists ordinary treatment. Some practitioners, on the authority of Cullen, have cut down upon the varicose veins and put tilularies round them. In one instance, Sir Almonst Howard, like Paul Camero, at Treviso, performed such an operation in St. George's Hospital. "In this case, venous inflammation took place, attended with so much constitutional disturbance, that the patient nearly died." (*See Annals of Medicine, in Lond. Med. Rev., vol. xiii. p. 519.*) At the present day, this use of the ligature is abandoned; for if not followed by a gangrene or fatal attack of phlebitis, it would certainly be so by atrophy of the testis.

J. L. Petit, in several instances on many the districts of varicose spermatic veins, as is stated, with such effect, that, in one instance, where the varicocele had been so large as a child's head, previously to the operation, the testis of the testicle, which had been in a weakened state, was strengthened by this procedure. More generally, however, atrophy, or sometimes even suppuration of the testis, might be a consequence of the ligature or section of the veins. It appears that the latter was what happened to the patient operated upon by Dieffenbach, and by whom simultaneous double surgery was ascertained not to be wrong. (*See Monat., Opht., vol. iii., p. 45.*)

In the hope of avoiding both pain and atrophy of the testis, M. Duvergne recommended passing under the vein, through the inguinal ring, a pin, over which a thread was twisted so as to make pressure. With the same view M. Brocq proposed diminishing the pain by pushing it up together with the skin, by means of a pair of counteracting forceps. Another practice is that of the Ficker, which consists in passing a seton, of three or four threads, through the handle of varicose veins. In a case of varicocele of such severity as to require an operation, Mr. Mayo would be disposed to recommend the application of potassa fusa to the places of rings, having first exposed them by dividing the skin. (*Quæst. of Human Pathology, p. 382.*)

The practice advised by Broussais or Frickel has the recommendation of simplicity and tidiness. But I believe the necessity for any operation is very rare. In one case, where the pain was excessive, and supposed to arise from pressure of the vein on some nervous filament, Sir Benjamin Brodie divided the skin, and then cut through the vein with a pair of scissors.

"A little bleeding took place, but none of any consequence; pressure for a few minutes stopped it. The wound healed in an uneventful followed the operation, and the patient was entirely relieved of the pain he suffered previously." (See *Lond. Med. Gaz.*, vol. xli. p. 572.) In another case of high varicocele, in a boy, the same gentleman applied a flaster over the tumour, and kept it open, and the varicocele and the pain were considerably lessened by it.

"Broussais's plan of grasping the veins, whether at the end or of the extremities, by forceps constructed for the purpose, has frequently answered, and has not often been followed by the severe and dangerous symptoms of phlebitis. The parts included in the forceps, not excepting even the vein itself, having sloughed, the ulcer healed. Mr. Sisson has constructed forceps for the same purpose, with blades so bent, that he keeps the sides of the vein in contact for the extent of nearly an inch. It is said to be not absolutely necessary that the vein should be included between the blades of the instrument, nor that adhesive inflammation should arise. It is sufficient that the vein be compressed, so as to stop the course of the blood when a clot forms, which is subsequently absorbed, leading to obliteration of the cavity of the vessel."—(*J. C. Crooke*.)

The passing of needles through the various vein, after the ingenious manner first practised by Mr. Benjamin Phillips, for the obliteration of arteries, has been recently tried by Lallemand, Daval, and Velpeau. The last five also passed needles through the vein, and twisted a ligature spirally, or in the direction of the fig. 8, under the projecting ends of each needle, so as to compress the vein. Mr. Crooke has likewise tried this plan, and, although there was suppuration in the cellular substance, neither general fever nor phlebitis arose, the patient being quickly cured of a troublesome tinea, and the dilated vein returned, or obliterated. In University College Hospital, Mr. Liston follows the same practice, with the improvement of withdrawing the pins at the end of about forty-eight hours, whereby the sloughing and absorption, produced by the pins being left to make their way out, as exemplified in the method adopted by the above mentioned practitioners, are completely avoided. I consider this practice, as modified by Mr. Liston, to be, upon the whole, one of the best and safest plans for the obliteration of the channel of a vein.

Mr. Wernsdorf, his lately mentioned German cases in which painful varicoceles were removed by means of a ring, about an inch in diameter, made of soft silver wire, of a suitable thickness, yielded, and covered with wash leather. "Through this (says he) I drew the lower part of the scrotum, while the patient was in the recumbent position, and the veins comparatively empty. I then pressed the sides of the instrument together with sufficient force to prevent the scrotum escaping. The use of this instrument, every morning before the patient rose from his bed, enabled him to walk nineteen

miles on the third day after its application; and although he has for six years been in possession of the description, he has never experienced the least inconvenience." (*Med. Gaz.*, April, 1838. *J. A. Murray, de Circulo Uteri*, 1834. *Pott on Hydrocele, &c.* Richter in *Ann. Chir.* *Grat. No. 19.* and in *Obs. Chir. Soc. B.* p. 22. *Goose, Chir. Books, Musc. Lat. de Cuvier*, Baur, 1786.)—C.]

[Dr. J. C. Warren, of Boston, has been extensively successful in the treatment of this disease. In one case, he employed only a temporary ligature; in two cases, he used pins with the ligature; and in numerous cases, he performed excision; and in all these cases cured the disease.

Dr. J. Mason Warren, of Boston, has operated on fifteen cases with the same success. In three, he excised the veins; in five, he used the ligature; in six, he employed the pins; and in two cases, he adopted Sir Ashley Cooper's plan, by excision from the scrotum.

Dr. Geo. W. Norris, of Philadelphia, reports in the *Amer. Journal and Med. Examiner*, for 1838, cases of cancer and varicose veins, upon which he operated with success, by the method of Bland.

Dr. N. H. Smith has invented a new method of securing a portion of the pinning on Sir A. Cooper's plan of treating thrombosis, and which has very great advantages. He employs two flat semicircular blocks of wood, perforated near their round edges, for the passage of the needles, and for applying the ligatures; figures are left upon the edges of the blocks, so that the sutures may be all tied immediately after the excision, and before removing the blocks. His success is the best evidence of the superiority of his mode of operating.

Dr. F. H. Hamilton, of Rochester, has a paper in the *Boston Med. and Surg. Jour.* for October, 1841, in which he criticises all the various modes of operating for the radical cure of varicocele, and reports two cases, in which he divided the cord, ligated the vessels, and removed the testis on the affected side. In both cases, vitality remained as perfect as ever. Dr. H. thinks that castration is, in many cases, preferable to any other mode of operating for varicocele, and that the diseased testis being removed, there is less danger of the loss of vitality by the destruction of the other testis, than if the gland of the other side remain and perish, as it does under the other modes of cure.—(*Ibid.*.)

[EVANS, DISEASES OF. It was not till the latter part of the last century that any notice was taken of the veins like cancer, or various enlargements of them, requiring particular attention. At that period, indeed, Hunter noticed the fact of the veins in horses being sometimes found to be enlarged, thickened, and filled with pus. (*Trans. of a Soc. for the Improvement of Med. Knowledge*, 1793.) The observations which he also made on the local and constitutional effects of the inflammation of the veins in the human subject, drew considerably attention to the disease, on which a great deal of interesting pathological and practical information was acquired.

In some points, the diseases of veins resemble those of arteries; but in others, they differ from them. Thus, as Arterial aneurysms, in the veins an aneurysmal state is observed, corresponding, strictly speaking, to aneurysm; because their coats all yield equally to any pressure to which they may be subjected; whereas, in the arteries,

It is only the external coat which is capable of yielding in this way. (*Précis d'Anat. Pathol.*, t. II. p. 382.) The veins are rarely the seat of calcareous concretions, which are very common in the arteries; organized coagulated blood is more frequently met with in the former than the latter; and the same remark is made by M. Andral with respect to pus. "When pus is met with in arteries," says he, "it must be the majority of cases be looked upon as having had its source in these vessels; but when met with in veins, it may either have been produced in them, or have been introduced by absorption." (*P.* 392.)

When the inflammation of veins is not very extensive, its symptoms are the same as those of local inflammation in general; but when the inflammation extends into the principal venous trunks, and this is poured into the vessel, it is accompanied with a high degree of constitutional irritation, and such symptoms which bear a striking resemblance to those of typhus fever.—(*On the Inflammation of Arteries and Veins*, p. 311, 312.)

Inflammation frequently produces a thickening of the coats of the veins, as well as adhesion at their sides and obliteration of their cavities. Indeed, in some instances, these vessels have been found to resemble arteries in the thickness of their coats, and in retaining a circular form when cut across. (*Holgren, Op. cit.*, p. 513.)

Ulceration sometimes extends to the coats of veins, and by exposing their cavities gives rise to hemorrhage. In certain examples, it commences in the membranous lining, and destroys the other coats. In general, however, the adhesive inflammation permeates the ulcerative, and by obliterating the cavities of these vessels, prevents the occurrence of hemorrhage. When suppuration takes place in the vicinity of veins, their cavities, like those of arteries under similar circumstances, are filled with extensive plugs of coagulum, which prevent hemorrhage upon the separation of the mortified part.

Veins are sometimes ruptured without any previous morbid alteration in their structure, and the accident may be induced by muscular exertion, external violence, the sudden effects of the cold bath, &c.

Although a deposition of calcareous matter almost invariably takes place in the arteries of persons advanced in life, it is an extremely rare occurrence in the coats of veins.

Loose canals have been found in the cavities of veins; and tumors sometimes grow from their lining. In a case of scirrhus pylorus, Mr. Hodgson found a tumour, larger than a hazel-nut, growing from the lining of the splenic vein, and resembling, in its appearance and consistency, the disease which selected the pylorus. (*P.* 393.)

The veins, like the arterial system, appears to be capable of carrying on a collateral circulation, when any part of it is impervious. Even after the obliteration of the vena cava inferior, the blood has been known to be conveyed with facility to the heart through the smaller veins and vena argea. In the case recorded by Dr. Baillie, (*Treatise on the Inflammation of the Veins and Arteries*, vol. i. p. 127,) the vena cava was obliterated at the pericardium; the vena cava superior opened into it, so that not only the blood from the lower extremities, but also that from the liver, must have passed through collateral channels to the heart.

To inflammation of veins, M. Broussais first applied the very appropriate name of phlebitis, which, as M. Cruveilhier remarks, belongs both to medicine and surgery; there being a *venous phlebitis* and a *sympathetic phlebitis*, independent of any previous local injury. In France, he believes he has ascertained, that the greater number of individuals who die in consequence of venous and surgical operations, perish from phlebitis. (See *Trat. de Med. et de Chir. Prat.*, t. XII. p. 638, and *Anat. Pathol.*) In this metropolis, we find that a certain proportion of persons so circumstanced are thus destroyed, but not to the same extent as seems from M. Cruveilhier's account to happen at Paris.

Another division of phlebitis, adopted by this eminent pathologist, is, first—*acute phlebitis of free veins*; secondly, *phlebitis of veins contained in the substance of organs*; and, thirdly, *capillary phlebitis*. It is also distinguished into *cellular phlebitis*, where merely dense, or coagulable lymph, is effused within the vessel; and *suppurative phlebitis*, where pus is formed; the latter difference being decidedly the most important as relation to the severity and danger of the affection.

The first effect of every phlebitis is the coagulation of the blood, which becomes adhesive to the inner coat of the vessel. Each coagulum is absorbed, both in a systematic and in sympathetic phlebitis; and it constantly takes place in the experiments which Professor Cruveilhier made in living animals, whether by the introduction of a slender stick, or of a stimulating injection into the veins. In consequence of the interruption of the venous circulation in the inflamed vessel, the blood in it becomes stagnant, and, unless the collateral veins suffice for the circulation, there is an effusion of serum in the neighbouring parts. The painful oedema, the *phlegmasia alba dolens*, of paronychia, &c., as well as that which follows phlebotomy, or under any other circumstances, may be considered, says M. Cruveilhier, as a characteristic mark of phlebitis, and it is generally proportionate to the obstruction of the venous circulation of which it is the consequence. But, besides oedema, external phlebitis is accompanied with a hard, painful, and circumscribed cord, which runs precisely in the course of the vein. Inflammation of the lymphatics is readily known from phlebitis, by the minute size of the painful cord; its more superficial situation; the sinuous small knots, which are perceptible in it; the rose-coloured redness of the skin in the course of such cord; and other particular circumstances depending upon inflammation of the lymphatic vessels. But, with respect to the diagnostic differences between inflammation of deep-seated veins, and that of deep-seated lymphatics, M. Cruveilhier is of opinion, that they have not yet been determined.

The greater number of examples of phlebitis, says when abandoned to themselves, do not exceed the degree of inflammation which has, on its results, the coagulation of the blood with adhesion of the clot to the vessel, and which M. Cruveilhier terms *adhesive phlebitis*. Now (says he) this adhesive phlebitis is as frequent a situation of continuity in the veins: there is an adhesion without adhesive phlebitis in the uræmic veins, corresponding to the phlegmasia; so amputation, he would, on ligature of the arterial cord, without adhesive phlebitis in the divided vein. (*Cruveilhier, Op. cit.* cit.)

The adhesive form of phlebitis cannot be re-

garded as a very serious disease. The effects which follow the coagulation of the blood, do not extend beyond the affected vein. The blood gradually becomes deprived, first, of the serum which it may contain, and, secondly, of the colouring matter, the remaining fibrine either becoming organized or absorbed, and, in both cases, the veins being rendered aneurysmal. In other instances, as M. Cruveilhier shews, several facts and experiments tend to prove, that a passage for the blood may be formed through the thrombus, so, that the vessel that has been the seat of phlebitis only, after a time, be restored to its function in the circulation.

The formation of compact adherent clots, constituting adhesive phlebitis, is described by Cruveilhier as productive of no inconvenience; the individual being unconscious of its existence, except when it occupies a certain extent, and causes more or less interrupting of the circulation in the corresponding parts. Thus, (says he,) adhesive phlebitis of the sinuses of the dura mater is mortal, because the venous circulation of the brain is more or less interrupted. Thus, phlebitis of the temporal or external iliac vein occasions a more or less firm adenomatous swelling of the lower extremity, and sometimes even an impossibility of the circulation being carried on by the collateral veins; but (adds M. Cruveilhier) phlebitis is positively curable in this last stage, even in adhesive phlebitis. (See *Dict. de Med. et Chir. Franç.*, art. *Phlébite*.)

In many cases of phlebitis, neglected, or treated unsuccessfully, the formation of an adherent thrombus is only the first stage of the disease; suppuration is the second; and the phlebitis, which was at first adhesive, now becomes suppurative.

It would appear, that certain states of the atmosphere, or of particular localities, in short, all those which promote the occurrence of hospital gangrene and typhus, give a tendency to suppuration in veins; and hence, MM. Ribes, (*Soc. Méd. d'Emulation*, t. viii. 1847,) Bressler, (*Journ. Complém.*, t. ii. and iii. 1849,) and Broussard, (*Revue Méd.*, Juin, 1853,) have regarded the symptoms of typhus as more or less directly connected with phlebitis, or the presence of pus in the veins.

According to the investigations of M. Cruveilhier and other pathologists, a species of cases of the conversion of adhesive phlebitis into the suppurative, is some irritation of parts already in a state of inflammation, as, for instance, that produced either by attempts repeated at short intervals to extract dead bone, or a ball; that resulting from amputation performed in parts, which are the seat of an inflammatory process; or, still more commonly, the plugging up of an inflamed vessel for the stoppage of secondary hemorrhage.

With respect to the local changes attending the suppuration of veins, the first is the deposit of pus; and according to M. Cruveilhier, this happens, not between the vein and the clot, but in the very centre of the latter. At first, it has the appearance of wine lees, and then it becomes white and opaque. "The presence of pus (says he) in the centre of clots of blood, has led to the idea, that these clots were directly organized, and capable of inflammation and suppuration; in the same manner as it is admitted that the pus, or serum, which, in phlebotic effusions, is circumscribed on every side by a recently formed false membrane, is the product of an exhalation from

this membrane itself; but it seems to me more rational to admit, that the coagulum in phlebitis, and the false membrane in phlebitis, serve, in some measure, as filters, through which the products pass, which are secreted by the internal surface of the vein, or by the phlegon. The presence of pus, then, in the centre of a coagulum would appear, according to my view, to be a phenomenon of the capillary system." (Cruveilhier, *Op.* et *voll.*, tit. p. 641.) I quote this statement, because it presents, in a few words, the opinion of a most distinguished pathologist, on a point which is of some importance in relation to the theory of suppuration. (See *Suppuration*.) There are some examples of suppurative phlebitis, where the disease does not extend that first stage, in which the pus occupies the centre of the coagulum, and then the pus is deposited in abscesses, and the removal, or the organization of the coagulum itself may not even, without the presence of pus having been indicated by any symptoms. But, if suppurative phlebitis continues to make progress, the proportion of the circumferential vessels; that of the coagulum; and the vein soon becomes distended with this fluid. The pus is very seldom remarked to occupy uninterruptedly a considerable extent of the vessel. The inflammation, as M. Cruveilhier observes, not having the same degree of intensity at different points of the course of the vein, the result is that adhesive phlebitis, or incipient suppurative phlebitis, are interrupted by completely suppurative ones, and most commonly an adhesive phlebitis is situated at the limits of the suppuration, so as precisely to circumscribe it. All these appearances are excellently depicted in Cruveilhier's great work. (*Ann. Pathol.*, liv. xi. pl. 1.)

In a more advanced stage, the distended vein becomes knotty at the points where the pus accumulates. Such distensions may be carried to the degree, in which one might suppose the case to be an aneurism, not situated within the vein. After a time, indeed, the coats of the vein may give way, and then the pus beginning effused around, an abscess really follows suppurative phlebitis, and bursts externally; in which abscess it is sometimes difficult to recognize the vein, a more or less considerable portion of which is destroyed. To this stage of suppurative phlebitis, M. Cruveilhier refers—1. The fact, recorded by Mr. Teasdale, who found the internal jugular vein perforated, and communicating with a neighbouring abscess. 2. That reported by M. Kalkbrenner, who found the right common iliac vein ruptured by a very large fungiform sort of abscess, the extension of which was lost in a large abscess, situated in the cellular tissue of the pelvis, on the right side of the bladder. Nor could the slightest vestige of the femoral vein be detected, its track being occupied down to the knee by a mass of circumferential purulent matter. 3. M. Cruveilhier himself published an instance of suppuration, perforation, and partial destruction of the femoral, popliteal, posterior tibial, peroneal, and other veins, with communications existing between these vessels and abscesses. (See *Ann. Path. Méd.*, 1836, t. ii. p. 120.) "In this case, (says M. Cruveilhier) I was able to trace all the degrees of phlebitis, from coagulation of the blood to complete destruction of the vessel."

Phlebitis, even in the suppurative forms, produces only local consequences, so long as the pus is circumscribed by the adhesive inflamma-

tion, and the portion of the vein, which is the seat of suppuration, is excluded from the circulation of the blood. We find this condition described by John Hunter. Professor Cruveilhier alludes the following example of it: "A woman, seven or eight days, was affected with phlebitis in one of the superficial veins of the breast; the vessel formed a large indurated painful cord, extending transversely directly below the nipple; a fluctuation was felt at the inner extremity of the cord. There M. Cruveilhier made a puncture, and was surprised to find that the vein was immediately emptied by pressure made in the direction from without inward, and the prominence of the cord converted into a furrow." Suppuration went on for a fortnight, and the pus frequently collected again in the vein, in consequence of the closure of the small opening. The pus was succeeded by a limpid serum fluid, the constant presence of coagulative adhesive inflammation, which was soon manifested. However extensive phlebitis may be, provided the pus collected in the vein does not communicate with the mass of circulating blood, the effects of the disease are entirely local. The pus, like that of other abscesses, may be absorbed; or it may distend and thin the vein, and make its appearance through the ulcerated coats of the vessel, so as to cause an abscess liable to be mistaken for a common one. But, as M. Cruveilhier adds, no sooner is the tube formed by the clot broken, and secretly removed by absorption, and the stream of fluid abroad in, than typical symptoms immediately begin, preceded by violent shiverings, and soon followed by death. Frequently, the patient, who had been left perfectly free from indisposition on the previous evening, is found in the morning in a desperate state; in some cases, very nearly the precise moment of the entrance of the pus into the circulation may be specified. (Cruveilhier, *Dict. de Méd. et de Chir.*, t. xii, p. 513.)

Another fact, particularly explained by the same pathologist, is, that no ordinary mark of inflammation is ever noticed upon the inner surface of the vein in the various stages of phlebitis; that is to say, no injection of capillary vessels can be remarked. The does not colour, noticed by Cruveilhier and other pathologists, resembles a kind of pain, or agglutination. This it would seem, is observable in the adhesive stage, and entirely vanishes when pus takes the place of the coagula. These facts M. Cruveilhier deems of much importance, because the absence of the anatomical phenomena of inflammation upon the internal coat of the vein, and more especially of all injection of the capillaries, has served as the principal argument of writers, who contend that pus found in a vein is not formed there, but in some other part of the system, whence it has been conveyed by means of absorption; but, as he observes, there are some membranes with which cannot be injected, and in the healthy or morbid state: such are serous membranes, the fibrous epineurium, peritoneum, tunica mucosa, the internal coat of a vein, and also the cellular tissue. When there is no phlebotomy, and no pus in the vein, it is by the easiness of the external coat, and the diffusion and fulgurance of the cellular tissue on the outside of it, in which a plastic lymph has been deposited, that one may recognise the traces of venous inflammation.

It has sometimes been supposed that the inflammation of a vein always extends only in one

direction towards the heart, or in the course which the venous blood itself takes; but this is a mistake as anybody may convince himself by reading the interesting particulars of a case of phlebitis following a gunshot wound of the arm, as recorded by Cruveilhier, (*Ann. Pathol.* liv. xi.) and the plate representing the appearance of the veins. There it will be seen, that phlebitis may extend simultaneously, not only in the direction towards the heart, but in the opposite one, by continuity to the smaller veins.

Professor Cruveilhier has given an excellent description of the general phenomena of phlebitis, which are such as are very usually noticed in the absorption of pus; namely, exceedingly bad typhoid symptoms, under which the patient sinks with more or less rapidly. "On opening the body, numerous unorganised collections of purulent matter are found in the lungs, liver, spleen, brain, and muscles; purulent effusions in the synovial and serous membranes; and (what is particularly remarkable) this internal mischief is most frequently unattended with any other local perceptible alterations of the affected organs. For the illustration of this part of the inquiry, M. Cruveilhier adverts to the most common phlebitis, that which is the consequence of wounds and surgical operations. The earliest observers, who endeavoured to detect the cause of death in such cases, did not fail to notice the existence of intestinal abscesses in the perforated viscera, and especially in the liver and lungs. Modern pathologists having become also fully conversant with the frequency and gravity of these lesions, do not hesitate to regard them as an ordinary cause of death from wounds. Now, as the greater number of the subjects of wounds and surgical operations were known to have, been previously in perfect health, the venous mischief in their viscera could not possibly be supposed to have existed prior to their wounds. The question then arises, whence does the typhoid matter come from?"

The doctrine of the absorption and deposition of pus, says M. Cruveilhier, so long disbelieved, as well as all the other hygienic doctrines, has lately been revived, and supported with much talent by M. Velpeau in a series of interesting memoirs, and also by MM. Marjolin and Eugene Legros. These authors admit that (as observed in the deep-seated parts, or on the surface of the body, may be absorbed, circulate with the blood, and be deposited in the substance of this or that organ, without any previous inflammatory process in the seat of such deposits. The facts adduced by these pathologists, M. Cruveilhier acknowledges to be equally unassailable; but it is their interpretation of them which he considers may be mistaken. "MM. Velpeau, Marjolin, and others, have supposed in the veins, at the right angles of the heart, and in the course of flow of the blood, like them, says M. Cruveilhier, I have seen the same things all modern observers have likewise done so. Not less frequently also (*Ann. Pathol.* liv. xii.) I have found pus in the lymphatic vessels. Like them, I have seen effusions of pus in different organs; the lungs, the liver, the brain, the spleen, the muscles, and the serous membranes, without any manifest evidence of inflammation around. The veins, the lymphatic vessels, and the heart, though they contained pus, seemed also in the state of the anatomical characters of inflammation." (*Id.*, *ib.*, p. 617.) M. Cruveilhier then offers various

tensions, which appear to him to be in favour of the formation of pus in the situations where it is met with. He objects to explanations, in which the metaphorical expression, sympathy, is substituted for fact. "If the liver is so often affected in wounds of the head, it is, according to Desault and Bichat, because the liver and gastric organs are so closely connected with the brain by sympathy. The whimsical and opposite modes of accounting for abscesses of the liver after injuries of the head, adopted by Fontana and Bertrandi, are well known. M. Richerand suggested the notion that these abscesses were owing to the simultaneous contusion, or concussion of the liver and the brain; and this view may afford a satisfactory explanation of some hepatic abscesses; but the production of those abscesses, with which are to be arranged infantile, mortons of the tympanic and serous membranes, muscles, and cellular tissue, is too general a fact, and, in the majority of instances, too independent of all contusion and concussion, to permit the adoption of so limited an explanation."

Anatomy is invoked in vain to fill the void that bites these phenomena. The porosity of our textures, which, according to the ancients, allowed fluids to filter from one place to another, as through a sponge; the perviousness and continuity of the cylindrical tissue, in the cavities of which fluids made so ready fluids, and even in many cases of disease, more so; imbibition, endosmosis and exosmosis, substituted of late for the porosity of the ancients; the continuity of the nervous and vascular systems; the sympathetic correspondences; the law of consensus; in a word, the whole science of organization, are all confessedly incapable of accounting for so extraordinary an occurrence. An inflammation, which seemed to have nothing to do with that now under consideration, phlebitis, has filled up the great void, that seemed to separate the suppurating wound from a venereal abscess. A series of numerous experiments which I published in 1826, (*Neur. Hist. Med.*, t. iv.) appear to me to have rigorously established this proposition: Every foreign body introduced in the femoral subject into the venous system, or osseous, when its discharge by the membrane is impossible, vascular diseases, completely resembling those consequent to wounds and surgical operations; and such abscesses are the result of capillary phlebitis in these vessels.

¶ If any irritating fluid, such as ink, for example, is thrown into the femoral vein of a dog, (in the direction from the heart,) which is practicable after a few of the valves have been destroyed with a probe, and the collateral veins do not convey the liquid into the circulation, in which case the injection proves immediately fatal, the limb in 20 hours becomes swollen, and if the animal then dies, or is killed, innumerable bloody extravasations are found in the substance of the muscles, and in the cellular tissue of the limb. The large veins are distended with coagulated and adhesive blood; and the small veins, corresponding to the extravasations, are also full of concrete blood, while those appertaining to the healthy parts are free. If the animal survive the experiment, collections of pus replace those of blood, at the same time that pus is substituted for the coagulated blood in the veins. M. Cruveilhier, instead of using a chemical irritating mass, next employed a mechanical one; he passed a stick into the femoral vein of a dog, from below upwards, into the ascending

vein cava. The dog died on the sixth day. The lower extremity was enormous, the infiltration extending up to the pectoral of the chest. All the veins of the lower extremity were full of pus. When the muscles were divided, small abscesses were seen here and there in them, which proved to be minute veins, swollen with purulent matter, which could easily be pressed out of these vessels. Amongst other effects noticed by Cruveilhier, there was also a collection of pus in the synovial membrane of the knee.

M. Cruveilhier then endeavoured to ascertain what became of the pus of a local phlebitis, when such pus was mixed with the mass of circulating blood; but, since purulent matter cannot be detected when blended with the blood, he was obliged to supply in lieu of it mercury, a liquid, the smallest particles of which, however situated, would admit of being traced. Now, he found, that if mercury be introduced into the venous system, whatever be the way of its entrance, (excepting through the abdominal system,) the mercury is always found again in the lungs. Thus, (says M. Cruveilhier,) if a large quantity of quicksilver be injected into the jugular or femoral vein, the animal will become exceedingly oppressed, and perish, in twelve, eighteen, or twenty-four hours, in a state very analogous to that observed in scurvy, or infectious venereal. The whole of the mercury will be found again in the lungs, which will not be infamed, but clogged with serosity; that may be compressed out of them. But if the quantity of quicksilver is smaller, the animal will survive the experiment a longer time, and then there will be perceived an induration around each globe of the mercury; in a later stage, collections of pus, and, at still more advanced period, a mixture of pus and tubercular matter. Lastly, if the animal survive for two or three months, tubercles are found with a globe of quicksilver in the centre of each of them.

M. Cruveilhier alludes to the contemplation of physiologists the following experiment, which he has varied in a thousand ways, and always with the same result. He destroyed the nodular texture of the testis, and substituted quicksilver for it. The dogs experimented upon lived four or five days, and, on opening them, he found all the quicksilver scattered through the lungs, and each globe decomposed by a degree of inflammation. The quicksilver was lodged in the ramifications of the pulmonary artery, which we know perform in the lungs the office of veins.

The liver being the seat of a particular system of veins, which are destined of valves, and have numerous ramifications in the mesentery, M. Cruveilhier drew out a vesicle of intestine, and injected quicksilver into one of the mesenteric veins. In a dog which survived this operation twenty-four hours, he found the liver studded with red, papillary, and slightly prominent patches, of the colour of wine-lem; and in the free space when cut open of a fold with these patches, presented the same colour to the depth of four or five lines. In the centre of each small red induration was a globe of quicksilver; a certain quantity of which had penetrated into the small veins which run on the coats of the intestine. Opposite these small intestinal veins, the mesentery membrane was of a bluish-red colour, and lined with a finer membrane and closely mucous. The corresponding subperitoneal cellular tissue, and the muscular coat itself, were also of a crimson hue.

In another experiment on a dog, which led an untroubled existence, M. Cruveilhier injected quicksilver into a small vein of the abdomen. In about ten weeks the animal was destroyed. The abdomen was found adherent to the exterior of the abdomen; pus, through its whole extent, a great many abscesses, very firm nodules, scattered or aggregated. The liver was studded with innumerable yellowish nodules, some of which lay near its surface; others in its substance, and each having at its centre one or more globules of quicksilver. Some of them presented two distinct studs; one of a tubercular substance at the circumference, the other of puriform matter in the centre, in the middle of which were the tubercular globules. The preceding facts seem to M. Cruveilhier to prove that all extraneous bodies, introduced into the general circulation, are inevitably conveyed to the lungs, and such as enter the abdominal venous system, as certainly proceed to the liver; these viscera constituting a barrier, which they cannot pass beyond except in certain cases.

The experiments quoted by M. Cruveilhier solve one difficulty, which clinical observation alone could never have solved: how, in the hypothesis concerning phlebitis, is the pus conveyed from the general venous system into the capillary system of the liver? Should not the pus stop in the capillary vessels of the lungs? It seems as if abscesses should only take place in the latter organs; yet experience proves, that abscesses of the liver are very common after wounds and surgical operations, and this, notwithstanding the capillary system of the liver only communicates directly with the venous part and the hepatic veins. But this objection is at once refuted by its proper cause by the demonstration of that viscid liquid, quicksilver, passing completely through the capillary system of the liver, when injected into the branches of the venous part; and, in other cases, passing through the general and pulmonary capillary systems; or, what is still more convincing, pervading several times the different orders of capillary vessels.

Perceiving Cruveilhier, therefore, considers it to be proved, with all the exactness of physical experiments, that pus, introduced into the circulation with the blood, is stopped in different departments of the capillary system; that it everywhere excites capillary phlebitis, or circumscribed inflammations, which advance more or less rapidly to the state of abscesses; that pus, like quicksilver, is most frequently stopped in the lungs, and next in the liver and spleen; and that, like quicksilver, it may pervade the capillary system several times in succession, and occasion circumscribed inflammations in all parts of the body.

The next question which M. Cruveilhier considers, why do not modified rheumatic abscesses take place in cases of system accidents, that of pus, for instance, in those from chronic phlebitis and phlebotomy? Is it necessary that there should be a transmissible phlebotomy in some part of the system to produce a capillary phlebotomy in the viscera? All observers, and especially in particular, he says, have noticed the vast difference in relation to consecutive effects between abscesses of long standing, and the suppuration from recent wounds. To what can this difference be ascribed? Is there absorption of pus in one instance, and not in the other? The following is the explanation immediately derived from the

facts:—Whenever a fluid, capable of being absorbed, is in contact with a suppulating surface, whether such fluid be secreted by the texture of the body, or be extraneous to the system, it is absorbed. The absorption of pus is occasionally taking place. "I will not cite (concludes M. Cruveilhier) the numerous cases, which prove the occasional presence of pus in the lymphatic vessels and glands, because pus, so situated, might be regarded as the product of their inflammation; but I will cite the very common and repeatedly observed disappearance of large abscesses, the opening of which has been destroyed." Yet, the constitution undergoes no disturbance from this cause, and the heterogeneous matter is eliminated by the excretories. It appears to M. Cruveilhier, that there is immense difference between pus which is transmitted into the circulation by absorption, and pus which is directly absorbed into it, without having undergone any modification, or preparation, by the act of absorption, or which is produced immediately within the veins themselves. (See *Ann. Pathol. Physico-Médic. liv. (c.) Anatomie des Vaisseaux de la Dure-Mère, liv. (vi.)* Pathology as well as physiological absorption does not act upon substances from mass, but successively on their different elements, which are thereby modified. Pus, in particular, would appear to be in the first instance deprived of its most fluid part, its solid part is not absorbed till a later period, and frequently as it has acquired a consensual consistency, lin. (vi.) A natural conclusion, directly blended with the blood, alters its mass. (as the ancient would say) embarrasses its course, promotes its coagulation, stops it in the capillary vessels, and, at the same time, gives rise to inflammation at numerous points." (Cruveilhier, *Dict. de Méd. et de Chir. Pratique*, t. xix. p. 657.)

It may be objected that, if the foregoing theory were true, modified abscesses in the viscera might always be preceded by phlebotomy in some part or another; yet, frequently, they are met with, and no traumatic suppuration can anywhere be detected. It is in no purpose that all the veins are inspected, and only those which upon a wound, an ulcers, abscess, from it; nowhere can any marks of phlebotomy be traced. Now, on this fact, which excited Mr. Arnet's notice, M. Cruveilhier argues that, unless the state of the medullary canal, or spongy texture of the bones, be examined in such cases, the inference is of no value, because incomplete. M. Duret seems to have been the first pathologist who gave a correct explanation of the cause of abscesses of the liver from wounds of the head, viz. the inflammation of the deep veins, not merely of those which ramify in the brain and its meninges, but also of those which penetrate the bones of the cranium—the veins of the diploe. Pus formed in the diploe, or the meningeal veins, may reach the liver as well as the lungs, and, indeed, every part of the venous capillary system; for the liver is not exclusively affected by vessels of the brain, and, as M. Cruveilhier remarks, if many abscesses have only spreaded the liver, it is because they were mostly supplied with the infection of that vessel. "What M. Duret proposed as a conjecture, has been completely established. In several cases of wounds of the head, the veins of the diploe have been found purulent, and this state coinciding with abscesses of the liver and lungs,

Several interesting specimens of this were presented to the Anatomical Society; and, at the present time, it may be announced (says M. Cruveilhier) as a demonstrated truth, that, in cases of wounds of the head, the vascular diseases, whether of the liver, the lungs, or spleen, &c., are the consequence of phlebitis, and more especially of phlebitis of the juglar; but the observation, that inflammation of the veins of bones, as a cause of vascular diseases, applies, not only to the veins of the spine, but to all the veins of bones; and I lay it down as a general proposition, that phlebitis of bones is *being the most frequent cause of vascular diseases, after suppuration and surgical operations impeding the blood.*" (*Op. cit.* vol. tit., p. 600.)

Treatment of phlebitis comprehends—1. Phlebitis from extension, 2. From the division, extension, or ligation of veins in the treatment of varicose veins, which Cruveilhier is surprised are not the subject of universal attention, considering the fatal consequences frequently occasioned by them. 3. Phlebitis from wounds of the head, gunshot wounds, compound fractures, various surgical operations, lithotomy, the extraction of encephaloid polypi, the excision of hemorrhoids, the prolonged continuance of a catheter in the bladder, &c. Phlebitis has been known to follow incisions for the extraction of bills, the removal of fatty tumours, a meliorism of the head, and even a sacro contusion of the leg. (Cruveilhier.) The last case of phlebitis which I met with, arose from a severe contusion of the elbow, where abscesses formed, communicating with the vein, attended with severe constitutional disturbance, and soon followed by abscesses in both legs, and gas in the synovial membranes of the ankle joints. No suppuration could be traced in the upper leg; but the nodular texture of the bones of the arm was not examined. Phlebitis may indeed come on in the suppurative stages of many diseases. I have known it arise as a consequence of an enormous carcinoma, and lead to the formation of numerous abscesses, several of which occurred in different synovial cavities.

Ulcer of phlebitis is known to be one of the worst forms of pyæmic fever. Next to traumatic phlebitis, see 66. the most frequent cause is phlebitis of the lower extremities, consequent to ulcers and syphilitic phlebitis. This takes at it, however, may take place under two distinct conditions: 1. After paronychia, 2. In cases of cancer of the wound. But, for information on these topics, I must refer to the writings of Dr. D. Davis, Dr. Robert Lee, Professor Cruveilhier, (And. Pathol., liv. xxiv.) and others.

With regard to the treatment of phlebitis, this must vary according as the affection happens to be in the adhesive or the suppurative stage. Or rather, I might say with Professor Cruveilhier, the only period when any means are likely to avail, is that very early one of the coagulation of the blood within the vessel; for when suppuration has taken place, and gas has actually entered the circulation, medicine is generally inefficient. Just as an external phlebitis is fully seen to be checked by bleeding, cold applications, the free administration of calomel, and the application of numerous leeches in the course of the inflamed vein, so may internal phlebitis, whatever its situation, be stopped by early recourse to cupping bleeding, and to the free use of leeches and mercury. I believe all the best practical writers on disease phlebitis

give their testimony in favour of rigorous and phlebotomic treatment, adopted in the earliest stage of the case. Dr. Robert Lee is an advocate for it, and Professor Cruveilhier, in his practice at the *Hôpital de la Pitié*, believes, that he has often subdued morbid phlebitis by means of general and local bleeding; resorted to early, and practised with freedom; but, as he observes, no sooner is the first stage over, and the constitutional derangement begins, than bleeding and leeches have no beneficial effect. Doubtless, he remarks, this may take away, with the blood, a portion of the material cause of the disease, but such cause continues to be incessantly reproduced, and the patient, together with his blood, is deprived of the power of reaction. Under these circumstances, bark, sulphate of quinine, carbonate of ammonia, ether, wine, bread, and opium, or the preparations of mercury may be tried, with or without two or three grains of calomel every night, and with repeated leeches and warm applications. However, it is attested by all who have seen much of syphilitic phlebitis, attended with the effects resulting from the direct influence of pus into the circulation, that no treatment, hitherto suggested, appears to possess any great power over this form of the disease.—[C.]

[Signature of the *Internat. Jugular Syph.*—The following operation is original with Professor Stevens, and has not hitherto been published.]

"The question of the possibility of tying the internal jugular vein in operations for the extirpation of tumours in the neck is one to which the attention of surgeons must have often been directed with great anxiety. The records of our art do not furnish, to my knowledge, any case in which this operation has been attempted. That which I am about to relate establishes the important fact that it may be tried with safety."

"A man of middle age came under my care in the New York Hospital during the last winter, (1820,) with an extensive flattened tumour under the sterno-mastoid muscle, formed at the clavis of lymphatic glands, which encompassed the great vessels on the left side of the neck, in a state of great enlargement. It had been the subject of a previous unsuccessful operation, and was then thoroughly obstructing the passage of deglutition and respiration. In the course of my operation for the removal of this tumour, after it had been detached, except at its base and posterior edge, I drew the tumour externally and backwards, and divided a vein of considerable size, passing horizontally outwards, near its junction with the internal jugular. Half an ounce of venous blood escaped, and in an instant afterwards a pulsing sound was heard, like that occasioned by allowing into a syringe the last portions of water from a basin. It was a moment of intense anxiety, for the state of Digestion's patient was fresh in my recollection. I immediately placed my finger on the aperture in the vessel, seized the pulse with the other hand, and watched the patient's countenance. All seemed well, and the patient's reply to my interrogatory confirmed these favourable indications. After a moment's deliberation, I determined to pass a ligature around the internal jugular, below and above the junction of the wounded branch. It was accordingly separated from the par vagum and carried with the blunt point of an eyed probe, armed with a double ligature; one of which was secured below and the other above the wounded vessel. The operation, of which

effile remained to be done, was then completed. The man suffered from cough and difficulty of respiration between the fourth and seventh days after the operation, for which he was twice bled and took saline purgatives. The lephoria came away on the fourth day, and the case went on without any peculiarities.

"If the par-caverna can be divided on one side without endangering life, a question, I believe, not yet settled by positive experiment, the proposition will be established, that many aneurisms of the safe of the neck (the removal of which has now deemed impracticable) may be successfully obliterated."

The internal jugular vein has been twice tied successfully by Dr J. C. Warren, of Boston.

Professor Hamilton, of Geneva College, who was unfortunate enough to cut the internal jugular vein, in an operation upon the neck, thrust a sponge into the wound, and allowed it to remain until suppuration resolved it. The fibrinous discharge was discharged, and the patient recovered.

In the *Ann. Jour.*, for 1838, Professor Sewall, of Washington, publishes a letter from a medical friend in Paris, narrating a case of death, in the third day, from the entrance of a wire into the veins, in the operation of aspiration at the axillary region, performed by the celebrated Reiss. This letter corroborates the opinions of Magendie on the subject, together with experiments performed on living animals, in confirmation of his views. To this level, but valuable article, I have only space to refer the reader.—*Edin.*

[VEINS, VARICOSE.] Modern pathologists make a distinction between veins affected with simple hyperæmia, and veins in the varicose state. "Hyperæmia of veins (says Cruveilhier) is observed in all cases, where a great morbid or morbid influence action takes place in an organ; as exemplified in the uterine veins during pregnancy, and in cases of considerable hæmorrhæ or morbid outpour, or other growths in the substance of that vessel." Another cause of hyperæmia is some impediment to the course of the blood in the veins, &c. Whatever may be the cause, venous hyperæmia is characterized not only by dilatation of the veins, but by an increase of their length, so that these veins are tortuous, become a first tortuous, and afterwards uniformly twisted on themselves, attaining at last four or five times their natural length, and not recoverable, &c. When the dilatation occurs uniformly at every point of the circumference of the vessel, the blood circulates freely; but if so mixed; but, if one point of the circumference undergoes a change of structure, it yields, and then the blood is detained in it, and a partial stasis of that point is formed. In these cases, congestion, adheres to its interior, loses its red colour, and in the centre of the pile, stasis, varicose congestions are produced. Sometimes the cause of the venous congestion, inflammation, heat, and give rise to hæmorrhages, it says, scaly, dry, and which may prove fatal. There is then, but great difference between dilatation and varix; that, in one, there is integrity of the circumference, in the other, an alteration of them; in one, the vein finds all its contents in relation to the circulation; while, in the other, there is a stagnation of the blood and disease." (*Cruveilhier, Anat. Pathol.*, liv. xvi.) Certain facts, however, noticed in this article, prove that the kind of dis-

tension specified by Cruveilhier is not always pulsatile, inasmuch as the blood is not usually stagnant in varicose veins, and varicose aneurisms are only occasionally met with in them. M. Andral identifies not less than six varieties of veins:

1. Simple dilatation of veins without any other change, such dilatation affecting either their whole length, or consisting of intervals. 2. Dilatation, either uniform, or at intervals, with a dilated state of the vein at the dilated points. 3. Uniform dilatation, with thickening of the venous coats. 4. Dilatations at intervals, with thickening of the dilated points. In these veins had, at the same time that the vein increases in diameter, it increases also in length, and becomes bent and tortuous. 5. Dilatation, with the addition of septa within the vein, whereby the cavity is divided into little cells, in which the blood lodges and stagnates. 6. A singular disposition, combined with perforations in the coats of the vein, which communicates with the surrounding cellular tissue in a more or less diseased state, by numerous small apertures. "In dissecting a great number of true hæmorrhoidal swellings," (says M. Andral,) "never will any thing else be detected, but one of the other of these six varieties of phlebectasia, (varicosity) but this is not merely the case with veins, about the verge of the anus. I once met with the disposition, constituting the sixth variety, in the external jugular vein." (*See Andral, Précis D'Anat. Pathol.*, t. ii. p. 400.)

Professor Cruveilhier has recorded the particulars of a man in whom there was an extensive dilatation of the inferior vena cava, which freely communicated with the venæ portæ, through the intervention of the umbilical vein, the size of which was equal to what it usually presents in the fetus. (*See Anat. Pathol.*, liv. xvi. pl. 6.) The disease rarely occurs before the adult period of life, and its progress is extremely slow. It is very frequently remarked in pregnant women, who have passed a certain age; but it is particularly useful for it to happen in young women, even during a season of repeated pregnancies. Surgeons have not hitherto made out any very precise information respecting the kinds of constitution which promote the occurrence of a varicose enlargement of the veins. Nor has it been well proved that the disease often proceeds from swellings of the abdominal viscera, or any other species of tumour capable of mechanically obstructing the venous circulation. One or more veins of the same kind are at first most commonly affected with a slight degree of dilatation, without pain or any sensation of uneasiness. This beginning change gradually advances with great slowness, except in cases where it accompanies pregnancy, in which it, sometimes, runs its course with the lower extremities, as early as the first months, are frequently accompanied with largely dilated veins, or even with tumours formed by an aneurismal or cancerous. The veins gradually become more and more distended, lengthened, coiled up, and tortuous. The patient then begins to complain of a sense of heaviness, numbness, and sometimes of very acute swelling pain through the whole of the affected limb. In a more advanced age, in proportion as the venous disease, and especially when the dilated veins actually form tumours, the limb swells and becomes more or less edematous, according to the extent of the disease, and the time which it has existed. Delin-

thinks, however, that the edema in this case is not such as to justify the conclusion, that the increased size of the veins, and the way in which they distend the integuments, produce a mechanical interruption of the function of the absorbent system. For, says he, numerous varices are sometimes, both on and often met with, which are not attended with any swelling of the cellular substance; and cases are still more frequently seen in which there is a considerable degree of edema, while the varices are scarcely remarkable. When the latter have prevailed a long while, and made much progress, the coats of the affected veins are not subsequently thickened, swollen, and ulcerated, forming a sort of ball canal or solid tube. As Mr. Hodgson remarks, "the blood occasionally deposits strings of coagulum in varicose veins; when this is the case, the vessel is incapable of being emptied by pressure, and is firm to the touch. The coagulum does not in general fill the vessel, but by diminishing its calibre, it retards the flow of blood, and causes the dilatation to increase in the inferior portion of the vein, and in the branches which open into it." (*Cy. Les. of Arteries and Veins*, p. 541.) This gentleman has seen four cases, in which the coagulum accumulated to such an extent, that the sample of the diluted vessels were obliterated, and a spontaneous cure was the consequence. The excessive distention of the coats of a superficial vein produces an inflammatory irritation, at first in the adjoining cellular membrane, and afterwards in the integuments. These textures become first detached together by the adhesive inflammation; and if the distention continue to operate, they may at length ulcerate, and burst, and hemorrhage be the consequence. In such cases, the effusion of blood is sometimes considerable; but the syncope following it, or a moderate compression, generally suffices for its stoppage.

M. Veljeau cites one case, in which the bleeding from a varix of the leg proved fatal; and I have heard of other similar occurrences. In varix of the extremities, accompanied by chronic ulceration of the integuments, as Dr. Caruswell observes, extensive hemorrhage may be the result of perforation of a vein, not larger than a common quill. "I had (says he) an opportunity of examining the vein in an example of this kind, the morbid condition of which, and of the surrounding cellular tissue, afforded a satisfactory explanation of the fatal extent of the hemorrhage. The walls of the vein were much thicker than those of its artery of the same size, and were so firmly united with indurated cellular tissue, that a considerable degree of pressure was required to approximate their internal surface. The consequence of this condition of the vein was, that its capacity would undergo no diminution during the hemorrhage, the blood continuing to escape, as through an inextensible tube, by the opening which had been effected by ulceration. This patient, who was about 80 years of age, expired in the space of little more than ten minutes." (*See Caruswell's Observations of the Elementary Forms of Disease; Paris, on Hemorrhage.*)

By tying the principal venous trunk above the point to which the varicose branches proceed, it was believed that the flow of blood through them might be so retarded and impeded, that they would afterwards become filled with coagulated blood, and then gradually subside. The operation of tying the venous trunk with two ligatures,

and cutting through the vessel in the interval, has been accurately described by some of the old writers.

After the account of the perils of suppurative phlebotomy, as already given in this article, it is unnecessary for me to offer any further comment on the unjustifiable nature of this operation. In England it is now universally abandoned.

Mr. Ferrall has published an interesting paper, in which he notices the occasional suppuration of the wound after this operation. Such an event took place in some of Mr. Carmichael's cases, notwithstanding every precaution. Between the years 1824 and 1829, Mr. Ferrall performed the operation four times. In three of these suppuration occurred; the he imputes to a degree of laceration of the cellular tissue in turning the knife, proposed by Sir Benjamin Brodie; which was also sometimes found to be so. On this account, Mr. Ferrall recommends another knife with a straight back, and made as thin as possible for about a quarter of an inch from its point, without forming there a cutting edge. Previous to the operation, Mr. Ferrall surrounds the limb with straps of soap plaster, nearly as high as the situation of the cluster of varicose veins, and a roller is applied in the same space, ready to be continued up the limb, when the division is complete. The object of this is to lessen the flow of blood through the tortuous vessels, and consequently their distention and irritation below the point of incision, when the action is interrupted. Mr. Ferrall deems it advantageous to let the bleeding go on for a little while. After the operation, a compress is laid on the part, and the roller, wetted with an evaporating lotion, continued up the limb. The patient is then put in bed, with his limb on a pillow, and the leg higher than the knee. For additional details I refer to Mr. Ferrall's paper. (*See Dublin Journal of Med. Science*, vol. ii. p. 239-254.)

Even when the vein was divided, and the skin left untouched, Bland saw sometimes phlebitis, and sometimes phlegmonous erysipelas, produced by the operation. (*Mémoires, Ann. de Méd. Opér.*, p. 164, et. 2.)

A few months ago, however, Sir Benjamin Brodie informed me, that he now rarely recovers ulcers the plan, as he believes that much of the relief which he formerly imputed to the operation, is the effect of quietude in the recumbent position observed after its performance.

The actual and potential cautery are ancient means for the cure of varices. Of late years, Mr. Mayo has in a considerable number of cases applied caustic, or caustic paste, over the trunk of the subcutaneous veins of the leg affected with varix. In some few instances, on the healing of the ulcer left by the separation of the eschar, no effect on the vein was observable; but, in most the greater proportion, the vein became firm and hard, and its cavity was obliterated at the part where the issue had been made. "I have little doubt, (says he,) that in the successful cases, the irritation upon the vein has caused local subacute inflammation, as a consequence of which the blood has coagulated in its cavity, and plugged it. The vein is often tender during several days, for the extent of three or four inches above the place at which the caustic is applied. The obliterated part does not exceed more than half an inch to an inch in length. I have never known acute phlebitis supervene in employing this practice. In one case, occurring

In a young woman, an interrupted dromed made a circular excision, two inches in circumference, and deep in proportion, over the superficial vein immediately below the knee; it opened the aneurysm, and within six hours there was violent venous hemorrhage; this, of course, stopped on pressure being applied. During the next few days, there was tenderness of the aneurysm, extending half the length of the thigh, over which leeches were applied once." The case ended well. (*See Mayo's Outlines of Human Pathology*, p. 433.)

Instead of dividing the skin, and tying or cutting through the trunks of varicose veins, or the excision of clusters of them, or the obliteration of them with caustic, another practice has arisen, viz., that of raising up the vein, together with the skin covering it, and then passing under the second a long needle or pin. The vein being elevated by means of the pin, is pressed down upon it, and then firmly constricted with thread twisted round the two projecting portions of the pin in the manner of the twisted suture. The subsequent pin, and the thread over the vein, press and flatten it; stop the flow of blood through it, and produce local inflammation in it, which is at first adhesive, then abscessive, and terminates in the obliteration of the cavity, and the division of the venous coats. In about eight or twelve days the pin is withdrawn, the threads removed, and the slough formed in the seat of the compression, left to separate of itself. The remaining sore soon heals up. This method, which was first tried on animals by M. Davat, has been practised by M. Velpeau on twenty-five patients for varices, and with almost-constant success. (*See Malgaigne, Ann. de Méd. Opér.*, p. 161. *Arch. de Méd. et de Chir. Prat.*, t. xv, p. 545.) It appears never to have been followed by any of the bad consequences too frequently occasioned by the simple ligation of the vein. In the treatment of varicose veins, M. Sauton adopted M. Brocchi's plan for the relief of varicocoele, (see this work,) while Dr. Fricke has, in not less than thirty instances, extended the use of the suture to the cure of varices, as well as varicocoele, and with successful results. M. Velpeau tried the method twice; transferring the vein from before backward, and then bringing out the suture again from behind, as Dr. Fricke recommends; but, as a good deal of phlegmoseous inflammation followed, M. Velpeau thinks that if this plan be selected, the needle should be passed only one direction in making the suture, as in Dr. Fricke's operation for the cure of varicocoele. (*See Malgaigne, Op. cit.*, p. 163.)

The application of tincture of iodine to the skin covering varicose veins has been suggested. I have seen it tried in University College Hospital, but without any benefit, except when might be ascribed to quiescence in the recumbent position, adopted in conjunction with it.

In surgical operations, when large veins are divided, or may ever flow; and, if in considerable quantity, the patient is seriously destroyed. I believe that the first instance in which such a catastrophe was partially averted, and accounted for, took place in the practice of Dupuytren. The experiments made by M. Ponselle led him to infer, that arteries only insinuate themselves into such veins as are provided with valves. (*Journ. Répt. de Méd. et de Chir.*, 1851.) but wounds of veins, in all many different situations, have sometimes been followed by this occurrence, that the foregoing inference is

not admissible; too, as the air takes the course of the blood, it is likely that the presence of valves would make such a difference. Thus, patients are stated to have been suddenly destroyed, or brought into most imminent danger, from the rush of air into veins, in operations performed by Dupuytren and Beauchamp, about the neck and shoulder. (*Piedagot, Thèse, Paris*, 1827; and *Archiv. Gén. de Méd.*, t. v, p. 424.) on the thyroid gland, by Gosselin, (*Journ. de Physiol. Exp. et Médicale*, 1829,) on the shoulder, by Costara, (*H. Semestre, Thèse, Strasbourg*, 1829;) and Delpsch, (*Ann. de l'Hôpital de St. Louis, 2de Année*, p. 64.) on the breast and axilla, by Dr. Warren, (*Gaz. Méd. de Paris*, Mars, 1833;) Sir Ashley Cooper and M. Guérin, (*Thèse, Paris*, 1834;) above the clavicle, by M. Roux, (*Journ. Médical*, t. 32, p. 165.) at the armpit and on the chest, by M. Clémont, (*Lancette Franç.*, 1831;) and on the face, by Dr. Mott, (*Amer. Jour. of the Med. Sciences*, Nov. 1828.) (*See Alf. Velpeau, Anat. Chir.*, t. i, p. 156, 2vo, Paris, 1828.)

Some of the cases here referred to, however, I think, will not be generally acknowledged as clear and unambiguous examples of death or urgent peril from the entrance of air into the veins, though others seem to admit of no question. These seem to me to leave no doubt of this being the occasional cause of death; but did any ambiguity exist upon the subject, it would be dispelled by the experiments instituted on animals in relation to this point, by M. Magrader and Piedagot.

The greater number of examples of death or imminent peril from the admission of air into the veins, have certainly occurred in operations about the neck. Hence, even in opening the external jugular vein, Baron Larrey's advice, not to discontinue the pressure on that vessel before the opening, until a compress has been applied, is well deserving of being attended to; for otherwise a slight operation might be converted into a suddenly fatal wound. (*See Alf. Velpeau, Anat. Chir.*, t. i, p. 491.)

The particulars of a similar disastrous accident, which happened in the practice of M. Roux, may be read in a modern work. (*See Light Jour. of Med. Science*, vol. iv, p. 474.) The patient in this case revived, however, and lived seven days afterwards. (See other cases detailed by Dr. Warren, in *Amer. Cyclop. of Pract. Med. and Surgery*, ed. by Dr. Hays.) In one of these, the temporal artery was opened, and the patient, after being insensible for two hours, recovered. In another, where the air had entered a vein divided in the scalp, the patient, a woman, aged 33, was lost, notwithstanding the use of external and internal stimulants, and even laryngotomy, as a last resource.—C.]

[Dr. J. C. Warren has operated upon thirty-nine cases of varicose aneurysm, and has variously employed the ligature, pin, and the division of the vein, adapting the method to the case. So far as I am from, he has had uniform and permanent success.]

Dr. Joseph Smith having witnessed several deaths at the Pennsylvania Hospital, from tying veins for the cure of varicose aneurysms, consulted with Sir Ashley Cooper, in representing this practice.

Dr. J. Watson, surgeon to the New York Hospital, applies a tourniquet to the limb, above the enlarged vessels, and then making an incision at several points, especially where the

veins anastomose, from the lower part of the thigh downwards, even as far as the foot, exposing the enlarged vein at the bottom of each incision, but without touching the vessel, until all the incisions have been made from above downwards. He then removes a small portion of each vein exposed, proceeding from below upwards, and applies pressure, so as to avoid hemorrhage. At each point he removes from half an inch to an inch of the enlarged vessel, thus completely interrupting the course of the blood. After thus excising the veins, the integuments are drawn together with adhesive straps, and a circular roller applied. The following day, if there be no contraindication, by great abundance in the limbs, the roller is passed over, and the limb dressed as with the starch bandage. The patient is kept in the horizontal posture for a fortnight, and the bandage remains undisturbed all this time. The limb being then exposed, the vessels are usually found to be completely united by adhesion, and the varicose vessels obliterated. In two cases, Dr. Watson has thus operated on both the external and internal saphenae at the same time, and no difficulty has attended the removal of the limb by the deep veins of the leg. The patients treated by this method, thus far, have had no return of the disease, and some

of them have been cured nearly a year. In many cases of varicose veins, Dr. Watson's plan will be found to possess great advantages over any other, and the operation is certainly creditable to his skill and science. It is certainly less dangerous, less tedious, and if successful in effecting a radical cure, of which his experience thus far is in evidence, it must soon supersede the ligature, the pila, the seton, or the caustic.

Dr. Mutter has frequently performed Ricord's operation for varicose veins, by substantial ligature, and with gratifying results. He expresses himself greatly pleased with this method.

Dr. Parker, of New York, was the first surgeon in America who practiced the substantial ligation of varicose veins, which he did successfully in 1831. He has also treated chancre in the same way, and with the like success.

Dr. Arnshy, of Albany, has adopted a modification of Sir B. Brodie's operation, by the substantial division of varicose veins, and with entire success. He applies a fine bandage to the limb, over its whole length, and continues it for weeks afterwards, with a graduated compression over the wound.—*Review.*]

W.

[WRY-NECK. As early as the year 1759, a case of wry-neck and distortion of the jaw, caused by contraction of the platysma myoides, was cited by division of that muscle. (See Bienenbach, in *Lancet*, for Sept., 1835.)

M. Guérin, of Paris, has devoted great attention to this interesting subject, and Dr. John Mason Warren, of Boston, has published a paper on the subject, in the *Boston Med. and Surg. Journ.*, for Sept. 25, 1841, abounding with valuable matter, both of a critical and practical character. He avails himself of the exposition published by M. Guérin, on the pathology, physiology, and surgical treatment of wry-neck. Dr. Warren has operated twice with the most gratifying success, and upon formidable cases, requiring the division both of the sternal and clavicular portions of the sterno-cleido-mastoid muscle, and in one, dividing the body of the muscle, just above its division, into its sternal and cleido-mastoid. In this case he was able to detach the muscle between the thumb and forefinger, and isolate it completely from the deep-seated parts; and he pursued the plan of Guérin, by cutting from within outward, on the subcutaneous method. In the other case, Dr. Warren employed a narrow, sharp-pointed bistoury, and cut from without inward, still, however, making but one incision, and dividing the sternal-mastoid, and then the cleido-mastoid, near their attachment, subcutaneously. His complete success is creditable to his science and skill.

In the reports of these cases, which are very carefully made, we find a confirmation of the anatomical changes and general deformities with which wry-neck is so frequently complicated, and all dependent upon the contraction of this muscle. The whole nervous system, as well as the soft parts, is found to be involved. There is an inclination of the cervical vertebrae

on the dorsal, of the dorsal on the lumbar, and of the lumbar on the sacral. The whole spinal column participating, there is an exarotation of the ribs on one side, and a protraction on the other. The face and head, especially on the side of the contracted muscle, are found to be atrophied, and an oblique position is communicated to the side of the face by the traction of the skin, resulting from the distortion. The eyeball also undergoes a rotation on its axis, so as to bring it into the horizontal direction, which occasions both a deformity and an obstruction to the vision for a time, after the restoration of the head to its normal position.

The morbid affections of the head and face are ascribed by M. Guérin to the distention which the great vessels of the neck undergo, before their entrance into the cranium. He also lays down the following propositions on the general subject:—

1st. The sterno-cleido-mastoid muscle constitutes, in fact, two distinct muscles—the sterno-mastoid and the cleido-mastoid.

2d. These two muscles are possessed of different functions, the sterno-mastoid being a flexor and rotator of the head, while the cleido-mastoid is essentially a muscle of respiration.

3d. In wry-neck the sternal muscle is principally affected.

4th. In the treatment of chronic wry-neck, owing to the shortening of the sterno-mastoid, the section of the sternal portion alone suffices to destroy the essential cause of the deformity.

M. Guérin regards acute cases as curable by the local application of antispasmodic and other medication, depending on it does simply on muscular contraction; but in chronic cases, he thinks a division of the muscle by reason of a fibrous degeneration, requires surgical interference. It is only in those latter that myotomy is necessary, and their long persistence

may render the division of both portions of the muscle necessary, as in the two cases reported by Dr. Warren, while in a majority of instances the sternid portion only will require to be divided, suitable mechanical means being subsequently employed, by bandaging and otherwise, such as will occur to any intelligent surgeon. Dr. Warren found in his cases, that to place the patient on an inclined plane for three or four hours daily, with the head secured by a bandage carried under the chin, and attached to the upper part of the board, was a valuable auxiliary. He recommends the narrow blunt-headed knife of Bozner as preferable for this operation.

The following cautions of Dr. Warren indicate the dangers of this operation, and will enable the surgeon to avoid them:—

In dividing the internal head of the muscle, we have occasionally lacerated the skin the anterior jugular vein as it passes across the neck, to enter the subclavian. This, however, is easily avoided by making the incision sufficiently near the clavicle. The external and internal jugular are protected by the sternohyoid and sternothyroid muscles, and could not be reached but by the point of the knife carefully introduced. In dividing the sterno-mastoid, the external jugular, which lies between the border of the muscle and the skin, may be wounded; this is avoided by raising the skin, and passing the knife with its cutting edge perpendicularly to the muscle, the vein being left between the back of the instrument and the skin. In dividing the body of the muscle, the external jugular is the principal vessel to be avoided, and with sufficient care may be easily left on the outside of the puncture necessary for introducing the knife employed in the operation.

The old operation for wry-neck, by making a transverse incision through the skin, exposing the fibres of the muscle, and then dissecting it layer by layer, ought never to be repeated, now that the comparative superiority of the subcutaneous incision has been so amply demonstrated. The inflammation and suppuration consequent upon the old method were severe and dangerous, sometimes fatal, from the pyæmic infiltration into the anterior mediastinum. So also the contraction of the cicatrix, after so severe a wound, often defeated the operation. Indeed, in many other operations, but especially in this, the principle of subcutaneous incision is to be regarded as one of the most important improvements of modern surgery. Its establishment is doubtless due to Stromeyer, who was led to its adoption in his earliest operations on club-foot,

by his anxiety to avoid the difficulties and dangers which Delpech had encountered in his unsuccessful case. This is the secret of Stromeyer's success, for in other respects he availed himself of Delpech's principles and practice as his guides.

Dr. Nathan R. Smith, of Baltimore, has operated successfully by myotomy for this disease several times since 1828, the date of his first case, and in his last two cases he has adopted the subcutaneous method, with manifest advantage over the former mode of operation.

Dr. Motl, of New York, has successfully divided the sterno-clavicular muscle five times for torticollis. He perfects the old method by cutting through the integuments, and dividing the muscle from without inwardly, with suitable caution, and then healing the wound by granulation, dressing it with lint. He saw M. Guérin repeatedly perform the subcutaneous section of this muscle in Paris, and witnessed its repetition again and again in the same patient, which was rendered necessary by the muscle reuniting when thus divided, a difficulty which is incidental to this plan, but against which this old method gives immunity. Besides, the subcutaneous section is necessarily hazardous, because of the proximity of the sheath containing the large vessels; and though M. Guérin cuts from without inward, and even from within outward, subcutaneously, and avoids the dangers alluded to, yet there are few beside himself who can do so with safety to the patient. The propriety of a subcutaneous incision, in immediate proximity to large vessels and nerves, when the eye of the surgeon cannot take cognizance of the wound inflicted by his knife, is very questionable. And moreover, the frequent failure to divide all the fibres of the muscle at a single operation, the difficulty of preventing them from uniting, and the necessity of repeating the hazards of the subcutaneous section again and again, are all valid objections against this method. Indeed, in myotomy, the same reasons for avoiding a wound of the integuments do not exist as in tenotomy.

Dr. Motl has lately treated a case of wry-neck dependent on paralysis of the sterno-mastoid on one side, so that by the action of the antagonist muscle the distortion was perpetuated, and had existed over a year, during which the lady had been treated unsuccessfully, both by local and general means. The paralyzed muscle was soft and perfectly inactive. The healthy muscle on the sound side being divided, the head was at once restored to its normal position, and the distortion has been permanently removed.—*RECAP.*]

* The editor ought to say, that several dissections, from eminent American surgeons, have been successfully obtained, as they failed to reach him in time.





